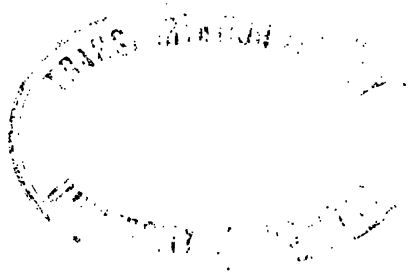

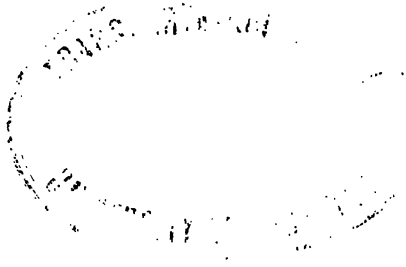

XXIII

RAILROAD VALUATION

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BY

HOMER BEWS VANDERBLUE, PH.D.

ASSOCIATE PROFESSOR OF TRANSPORTATION
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Transport.

TO
MY MOTHER

PREFACE

THIS series of books owes its existence to the generosity of Messrs. Hart, Schaffner & Marx, of Chicago, who have shown a special interest in trying to draw the attention of American youth to the study of economic and commercial subjects. For this purpose they have delegated to the undersigned committee the task of selecting or approving of topics, making announcements, and awarding prizes annually for those who wish to compete.

For the year ending June 1, 1915, there were offered: —

In Class A, which included any American without restriction, a first prize of $1000, and a second prize of $500.

In Class B, which included any who were at the time undergraduates of an American college, a first prize of $300, and a second prize of $200.

Any essay submitted in Class B, if deemed of sufficient merit, could receive a prize in Class A.

The present volume, submitted in Class A, was awarded second prize in that class.

J. LAURENCE LAUGHLIN, *Chairman*,
University of Chicago.

J. B. CLARK,
Columbia University.

HENRY C. ADAMS,
University of Michigan.

HORACE WHITE,
New York City.

EDWIN F. GAY,
Harvard University.

AUTHOR'S PREFACE

THE present volume is a study in the Economics of Railroads. But it is also a study in the Economics of the Distribution of Income. To this circumstance is due the frequent abbreviation of the argument through the use of the terminology peculiar to that field of the science. The meaning of such terms as differential returns, economic rent, capital goods, and capitalization of income, should, however, be readily apparent from the context. I have aimed to conform my usage to that of Professor F. W. Taussig, in his *Principles of Economics.*

In other directions, as well, I am greatly indebted to Professor Taussig. It was under his direction that the study was brought into its present form. I am also indebted to Professor F. S. Deibler, who directed a preliminary investigation made when I was an undergraduate at Northwestern. Professor J. M. Clark, of the University of Chicago, has given me helpful suggestions in the final preparation of the paper; and my colleagues, Professors F. E. Richter and W. E. Lagerquist, have read the proofs, and aided me with their criticism.

HOMER B. VANDERBLUE

NORTHWESTERN UNIVERSITY

January, 1917

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RAILROAD VALUATION

CHAPTER I

VALUATION AND REGULATION

"ALL charges for any service rendered, or to be rendered, in the transportation of passengers or property shall be just and reasonable." In this language the Interstate Commerce Act restates the doctrine of the English Common Law.[1] But no standard of reasonableness is stated, still less, imposed. The Act leaves with the Interstate Commerce Commission the duty of developing a body of principles governing the reasonableness of rates.

The Commission feels this responsibility in two distinct ways. An individual charge may be in question, or the reasonableness of the return to the carrier upon the total business done. The latter aspect of the problem is the one here to be considered. Though the Commission has, on occasion, protested that its authority is "limited to inquiring into the reasonableness of a particular rate or rates, and establishing the rate or practice which is found lawful in place of the one condemned as unlawful," [2] the adequacy of the total return to the railroad has been an issue under two sets of circumstances: when reduction of groups of rates

[1] I.C.C. *v.* C.N.O. & T.P. Ry. Co., 167 U.S. 479, 493.
[2] Eastern Advance Case of 1910, 20 I.C.C. 243, 248.

has been in contemplation in response to appeal by shippers;[1] and when tariffs containing important advances have been filed by the carriers.[2]

An alleged insufficiency of income has, indeed, been the principal ground on which the railroads have attempted to justify general advances sought. In the Five Per Cent Case, a difference of opinion developed within the Commission because of this fact, though all members agreed that the net operating revenue of the roads in Official Classification Territory, "considered as a whole," was smaller than was demanded in the public interest[3] — a finding which, however, cannot be said to have furnished the key to the original decision. For, though the insufficiency of revenue was determined by a study of the conditions of the Trunk Line, as well as of the Central Freight Association roads, advances were permitted only within the latter Territory. The explanation for this discrimination rested in other considerations than those of revenue. "No effort was made on the part of any of the lines in Official Classification Territory to show by what may be denominated rate testimony that the scale of through rates is unduly low, or that higher through rates would be just and reason-

[1] See especially the series of "Intermountain Cases": Spokane *v.* N.P. Ry. Co., 15 I.C.C. 376; 19 I.C.C. 162, 173; Commercial Club of Salt Lake City *v.* A.T. & S.F. Ry., 19 I.C.C. 218; Railroad Commission of Nevada *v.* S.P. Co., 19 I.C.C. 238.

The same problem appeared, though in slightly different form, since only singlecom modities were concerned, in Boileau *v.* P. & L.E. R.R. Co., 22 I.C.C. 640 (coal); Pittsburgh Vein Operators Association *v.* Penn. Co., 24 I.C.C. 280 (coal); Sheridan C. of C. *v.* C.B. & Q. R.R. Co., 28 I.C.C. 250 (coal); Lum *v.* G.N. Ry. Co., 33 I.C.C. 541 (iron ore); Pulp & Paper Mfrers. Association *v.* C.M. & St.P. Ry., 34 I.C.C. 500 (pulp wood).

[2] In the Matter of Advances, etc., 9 I.C.C. 382; Central Yellow Pine Association *v.* I.C.C. R.R. Co., 10 I.C.C. 505; Morgan Grain Co. *v.* A.C.L. R.R. Co., 19 I.C.C. 460; Eastern Advance Case of 1910, 20 I.C.C. 243; Western Advance Case of 1910, 20 I.C.C. 307; The Five Per Cent Case, 31 I.C.C. 350; 32 I.C.C. 325; The 1915 Western Advance Case, 35 I.C.C. 497; Western Passenger Fare Case, 37 I.C.C. 1.

[3] 31 I.C.C. 350, 351.

able." [1] For the rates applying solely within the Central Freight Association Territory such testimony had been presented.

The character of this testimony illustrates what an elusive problem is attacked when a definition of a reasonable rate is attempted. The Commission was convinced that the class rates controlled by the Central Freight Association scale were "lower than comparable rates prevailing in any part of the country," the level being "indeed so low that an increase of 5 per cent would clearly not be unreasonable." And the class rates affording "a reasonable test for measuring the general level of the commodity rates," the Commission thought that the carriers operating in that territory had sustained the burden of showing that the rates were unduly low, and that an increase in them of 5 per cent would be reasonable. These rough comparisons, supplemented with the testimony that the rate structure was "honeycombed with inconsistencies," "not logical," "unscientific," that the Central Freight Association scale was a "relic of barbarism," constituted the "rate testimony" on which the changes were approved.[2]

At the time the original opinion was handed down, dissents were written by Commissioners McChord and Daniels. For the purpose of the present discussion two important lines of reasoning were developed in these dissenting opinions, the one taking up the relation of needed revenue to advances; the other the relations of rates in Official Classification Territory, *inter se*. Both opinions objected that the majority, in confining approval to ad-

[1] From Chairman Harlan's dissent in the supplementary hearing, 32 I.C.C. 325, 333. Mr. Harlan wrote the original opinion, 31 I.C.C. 350, 404.

[2] 31 I.C.C. 350, 400, 401, 402. As to brick, tile, clay, coal, coke, starch, cement, iron ore, and plaster, the testimony was such as to constrain the Commission from holding that the carriers had sustained their burden under the statute (page 403). In the Supplemental Opinion, the permission was granted to increase rates except on coal, coke, and iron, 32 I.C.C. 325, 331.

vances within a limited area, had broken down the established relationship of rates. Commissioner McChord indicated that, as he saw the dictates of public policy, the aim of the Commission should be to preserve the existing structure. That no other expedient could be used had been assumed quite as a matter of course by Commissioner Prouty in 1910.[1] But a general increase of rates within only the Central Freight Association Territory meant a change in the rate relationship as between cities in that Territory and cities in Trunk Line Territory:

> "For many years the rates between these cities have borne a fixed and well-understood relation to each other. . . . If the rate from Pittsburgh to Chicago were increased and no change made in the rate from New York to Chicago, it is obvious that the latter city would obtain an advantage over the former, with respect to the rates in question, which it has never sought or claimed as a matter of right, and which would perhaps be unwarranted from the standpoint of geographical position. . . . The transportation conditions in the two territories are not so unlike as to indicate the wisdom of dissimilar treatment of the rates proposed." [2]

Commissioner Daniels accepted the reasoning here set forth:

> "There exists a presumption in favor of interrelations in a rate fabric that have long continued undisturbed. . . . With a demonstration of inadequate revenues, and with a presumption in favor of the propriety of the interrelation between rates long in effect, an advance moderate in amount, calculated to produce but a *reasonable* increment in earnings, and affecting all trade in the same proportionate degree, is the plain dictate of law and of common sense in the premises." [3]

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[1] Eastern Advance Case of 1910, 20 I.C.C. 243, 272.

[2] The Five Per Cent Case, 31 I.C.C. 350, 432–34.

Commissioner McChord also declared that the majority opinion placed "traffic passing into, out of, or through Central Freight Association Territory in a privileged class" (page 433).

[3] *Ibid.*, page 450. Commissioner Daniels would here seem to be using reasonable in a sense implying that the advances were not great. Or is his reference to an intrinsic reasonableness?

This paragraph supplies the key to the Supplemental Opinion, in which the Commission reversed itself, granting advances to the Trunk Lines.

Commissioners Harlan and Clements dissented from the Supplemental Opinion. In substance the same ground for objection was expressed by both men. Commissioner Clements saw in the majority opinion "a new and radical departure, and a most serious and portentous step." He was not aware of any case in which the Commission or any court had held "that the need by a carrier of money was of itself proof of the reasonableness of a specific rate, or body of rates, increased to meet such need." [1] The first record had contained no evidence seeking to prove that the proposed increases, except in Central Freight Association Territory, were "just and reasonable" in themselves; and what Commissioner Harlan had originally thought a "deficiency in proof" had not been supplied at the later hearing.[2]

But with the merits of a controversy involving the extent of discretionary power delegated by Congress to the Commission, there is no present concern. The issue involves legal not economic considerations. Certainly, however, the problem of determining upon the reasonableness of the return to the carrier is *not* one to which may be applied the "tests or factors heretofore deemed pertinent and necessary to the determination of the reasonableness of a rate." [3] It is impossible to leave a reading of the Five Per Cent Case without the feeling that Commissioners Clements and Harlan (in point of service, the senior members of the Commission) had come to look upon reasonableness as intrinsic, that they had failed to recognize the importance of the production of transportation service at joint cost.[4] Reasonableness is an uncertain quantity when

[1] 32 I.C.C. 325, 337.

[2] *Ibid.*, page 333.

[3] Commissioner Clements' dissent, 32 I.C.C. 325, 337.

[4] Aside from the general tone of Commissioner Harlan's opinion, there is his use of figures, submitted by the Pennsylvania, apportioning investment, and returns, freight and passenger, etc., 31 I.C.C. 350, 389.

applied to the individual charges contained in the railroad schedules. But however non-discriminatory and non-preferential a body of rates may be, it can hardly be called reasonable unless the normal return accrues in the normal case. From the *economic* point of view, Commissioner Daniels' conclusion that "proof of inadequate revenue suffices to meet the burden cast by the statute on carriers seeking the advance," can therefore be accepted.[1]

An analogous problem has been presented to the Supreme Court. The Fourteenth Amendment to the Constitution has been held to protect, from regulation by the States, "the right of the railroads to receive just compensation for the service given the public." [2] But a clear distinction has

[1] 31 I.C.C. 350, 451, Commissioner Daniels' dissent (original opinion); see also pages 435–36. The opinions by the Commission in the 1910 Cases would seem, however, to uphold the contention of Commissioners Harlan and Clements; see especially Commissioner Prouty's opinion in the Eastern Case, 20 I.C.C. 243, 249; and Commissioner Lane's discussion of the "American System of Railroad Rate-Making," 20 I.C.C. 307, 349.

In the 1915 Western Rate Advance Case, the carriers based their claims to additional revenue upon the grounds of their financial needs and the downward tendency of their net revenues in the Western Trunk Line Territory, and contended that the commodities singled out by them to bear the proposed advances were not carrying their equitable part of the costs of transportation. 35 I.C.C. 497, 500.

[2] Minnesota Rate Cases, 230 U.S. 352, 434.

For a history of the doctrine of judicial review, see "The Regulation of Railway Rates under the Fourteenth Amendment," by Justice F. J. Swayze, of New Jersey, *Quarterly Journal of Economics*, volume 26, page 389.

The courts have taken jurisdiction on the ground that "due process of law" necessarily involves consideration of reasonableness by the judiciary (C.M. & St.P. Ry. Co. *v.* Minnesota, 134 U.S. 418). The Fifth Amendment, which restrains the Federal Government, has, however, been interpreted not to demand judicial interference, or regular court proceedings (Murray's Lessee *v.* Hoboken Land & Improvement Co., 18 Howard 272), though this opinion was handed down in 1855, forty-five years before the opinion in C.M. & St.P. Ry. Co. *v.* Minnesota. That the strength of the more recent precedent would result in the rejection of the older reasoning is perhaps a fair presumption.

Yet to permit a court to put aside orders of the Interstate Commerce Commission establishing reasonable rates would apparently run directly counter to the doctrine of Texas & Pacific Ry. Co. *v.* Abilene Cotton Oil

been drawn between the legislative and judicial points of view. The Court can only insist that the return under schedules established under legislative order, or through the agency of a commission, shall not be "so unreasonably low" as to deprive the carrier of its property "without due process of law."[1] The confiscation doctrine therefore sets a minimum. How much more the rate of return may be, rests within the range of "legislative discretion."[2]

But both the Court, seeking a measure of confiscation, and the Commission, seeking a measure of reasonableness, especially since the Court may have occasion to pass upon the decision of the Commission, should, it would seem, use the same standard of measurement. The incidence of the viewpoint of the distinct and different bodies should be upon the rate of return. A reasonable return may well be something other than a non-confiscatory return. In other respects the economic problem seems identical.

I

It was Justice Harlan who first generalized that "the basis of all calculations as to the reasonableness of rates must be the fair value of the property being used for the public."[3] But his contribution was merely to put in clearer

Co., 204 U.S. 426. Especially is this true since the Supreme Court, in Northern Pacific Ry. Co. *v.* North Dakota, 236 U.S. 585, applied the confiscation doctrine to rates established by State Governments, applying on a single commodity. Can the rate on say lignite coal be at once "reasonable" and "confiscatory"?

[1] Minnesota Rate Cases, 230 U.S. 352, 433. See also the fuller discussion in Knoxville *v.* Knoxville Water Co., 212 U.S. 1, 16; Willcox *v.* Consolidated Gas Co., 212 U.S. 19, 41; *Ex parte* Young, 209 U.S. 123, 166; Louisville *v.* Cumberland T. & T. Co., 225 U.S. 430, 436. Even as early as Smyth *v.* Ames, Supplemental Opinion, 171 U.S. 361, the phrase "so unreasonably low," was used (page 364).

[2] L. & N. R.R. Co. *v.* Garrett, 231 U.S. 299, 313. See especially the cases cited at page 314.

[3] Smyth *v.* Ames, 169 U.S. 466, 546; sustaining Ames *v.* Union Pacific, 64 Fed. 165.

language conclusions already deduced by Justice Brewer.[1] There was nothing in the career of either of these men which promised peculiar aptitude for the theoretical and technical issues necessarily involved in determining upon reasonable railroad rates. In 1894, the date of his decision in Ames *v.* Union Pacific, Justice Brewer had spent over thirty years upon the bench, substantially his whole mature lifetime. Justice Harlan, who four years later wrote the opinion for the Supreme Court, had then been a member of that Court for twenty years. As a result both men had been shielded from participation in the discussion of rate regulation which persisted in the period after 1870. So, when the problem was thrust upon them by the reversal of the Granger Cases, it raised especially the question of the sacredness of private property. Accordingly, technical and economic considerations gave way to precedents taken from those aspects of judicial experience where the issue of vested interests was seen.[2]

[1] Indeed, there is peculiar irony in finding these words coming from Justice Harlan. Some years previously he had gone out of his way to condemn a proposed valuation test. The Mississippi statute of 1884, which came before the Court in Stone *v.* Farmers' Loan & Trust Co., 116 U.S. 307, directed the State Railroad Commission to revise the carriers' tariffs, permitting "a fair and just return on the value of such railroad, its appurtenances, and equipments" (page 309). Chief Justice Waite ignored the clause entirely in his majority opinion; not so, Justices Harlan and Field who dissented. Both rejected the proposed test flatly, though its adequacy was not in question before the Court, since the State Commission had been enjoined from establishing rates. It is clear that they were following the briefs for the railroads, that of E. L. Russell, at page 56, that of James Fentrees at page 27. See dissenting opinions: Justice Field, page 343; Justice Harlan, page 340, 116 U.S. 307.

The "valuation" test had previously been presented to Justice Woods of the Supreme Court, in the case of Tilley *v.* S.F. & W. Ry. Co., 5 Fed. 641, 662. Justice Woods, however, refused to depart from the doctrine of judicial non-interference set up in the Granger Cases (94 U.S. 113). See also L. & N. R.R. Co. *v.* Railroad Commission of Tennessee, 19 Fed. 679, 683.

[2] C.M. & St.P. Ry. Co. *v.* Minnesota, 134 U.S. 418. In Chicago & Grand Trunk Ry. Co. *v.* Wellman, 143 U.S. 339, 346, Justice Brewer emphasized the responsibility of the Court, "While the protection of

The result was an attempt to draw an analogy between condemnation and rate regulation, the terms of which were never clearly stated. In Reagan *v.* Farmers' Loan and Trust Company, where for the first time a schedule of rates was condemned as confiscatory by the Supreme Court, Justice Brewer introduced this line of reasoning. Both rate regulation and exercise of the power of eminent domain represent interference by the public with the undisturbed enjoyment of private property. In the one event, the income is affected, though the title remains undisturbed; in the other, title itself is taken. Now if the State were to condemn the railroad, "is there any doubt that constitutional provisions would require the payment to the corporation of just compensation, — that compensation being the value of the property as it stood in the markets of the world and not as prescribed by an act of the legislature? Is it any less a departure from the obligations of justice to seek to take not the title, but the use for the public benefit at less than its market value?" [1] The question is confusing. What shall determine the market value of the "use"? Or is it the "value" of the "property" to which reference is made? From the discussion no definite answer could be made with assurance. But in Ames *v.* Union Pacific, Justice Brewer referred to the analogy which he here hinted, and, without declaring regulation *pro tanto* condemnation, proceeded to argue upon that basis.

vested rights of property is a supreme duty of the courts," etc. See also his decision in C. & N.W. Ry. Co. *v.* Dey, 35 Fed. 866, 872.

[1] Reagan *v.* Farmers' Loan & Trust Co., 154 U.S. 362, 410. The Supreme Court has never declared regulation and condemnation analogous. Justice Brewer merely argued as though they were analogous. The lower courts (e.g., Spring Valley W.W. *v.* San Francisco, 124 Fed. 574, 594; Kings County Lighting Co. *v.* Willcox, 156 App. Div. N.Y. 603, 606) have, however, gone the full way. See Brief of Messrs. Dunlap, Norton and Lathrop for the Santa Fé, Evidence, In the Matter of Proposed Advances (1910). Senate Document 725, 61st Congress, 3d Session, page 3602, hereafter cited simply as "Evidence, 1910 Advances."

"Property invested in railroads," he declared, "is as much protected from appropriation as any other. If taken for public uses, its value must be paid for. Constitutional guaranties to this extent are explicit. . . . The value of property cannot be destroyed by legislation depriving the owner of adequate compensation. . . . The protection of property implies the protection of its value." Indeed, "if the public was seeking to take title to the railroad by condemnation, the present value is that which it would have to pay. In like manner, *it may be argued that*, when the legislature assumes the right to reduce, the rates so reduced cannot be adjudged unreasonable if under them there is earned a fair interest on the actual value of the property." [1] This train of reasoning Justice Harlan did not repeat. Instead he simply declared the railroad entitled to earn a "fair return" upon the "fair value" of the property, provided this could be secured from rates reasonable to the public.[2] This holding, like Justice Brewer's "that which

[1] 64 Fed. 165, 176, 177. The italics are the writer's.

[2] Smyth *v.* Ames, 169 U.S. 466, 547.

A supplementary opinion, seldom cited, held: "The general question argued before us on the original hearing was whether the rates . . . as an entirety, were so unreasonably low as to prevent the railroad companies from earning such compensation as would be just, having due regard both to the rights both of the public and of the companies. . . . We did not intend . . . to adjudge that the railroad companies should not, if they saw proper, reduce the rates, or any of them, under which they were conducting business . . . nor that the State Board . . . should not reduce rates. . . . It may well be that on some particular article railroad companies may deem it wise to make a reduction of the rate, and it may be that the public interests will justify the State Board of Transportation in ordering such reduction. We have not laid down any cast-iron rule covering each and every separate rate. . . . If the State should by statute, or through its board of transportation, prescribe a new schedule of rates covering substantially all articles and which would materially reduce those charged by the companies respectively, or should, by reduction of rates on a limited number of articles, make its schedule of rates as a whole, produce the same result, the question will arise whether such rates, taking into consideration the rights of the public, as well as the rights of the carriers, are consistent with the principles announced by this court in the opinion heretofore delivered." Smyth *v.* Ames, 171 U.S. 361, 364, 365.

is unjust cannot be reasonable," [1] seemingly begged the whole question.

These guarded statements may be taken as indicating the reluctancy of the mood in which the Court approached the problem over which it had taken jurisdiction so tardily. The Court was feeling its way, careful always to announce that each case must be considered by itself.[2] Indeed, had there been attempt at careful formulation and application of the "valuation" standard, — or need for it, — the doctrine must have been abandoned long before reaching the dignity of a precedent. For a "fair value" test of reasonableness (if by "value" is meant "exchange value," which, it would seem, is what Justice Brewer had in mind) involves arguing in a circle.[3] The analogy between condemnation and regulation is premised upon the condition that lower rates will reduce earning power, and, *pari passu*, the value of the property. How else justify the analogy at all? But to test rates by the value of the property before the act of regulation is made effective means the abandonment of regulation. And to test them by the value of the property, once the new schedules are in effect, means the approval of any schedule that may be established. The vicious circle is clearly present.[4]

Yet it cannot be said that Justice Brewer appeared to appreciate the difficulty. In part this was due to the general tone of his argument; in part it was due to the

[1] Ames *v.* Union Pacific, 64 Fed. 165, 176.

[2] This reservation appears also in the Minnesota Rate Cases, 230 U.S. 352, 434.

[3] The Commission has recognized this fact. In the Matter of Advances, etc., 9 I.C.C. 382, 403 (1903). Justice Brewer's theory of valuing fixed capital involved a capitalization of earning power, though he nowhere made a clean-cut statement of principle. Monongahela Navigation Co. *v.* U.S., 148 U.S. 312; C.C.C. & St.L. Ry. Co. *v.* Backus, 154 U.S. 439; The Express Cases, 166 U.S. 185.

[4] The "circle" in the "valuation" test was noticed in Cotting *v.* Kansas City S.Y. Co., 82 Fed. 850, 854. It was also cited by J. D. Works in San Diego L. & T. Co. *v.* Jasper, 174 U.S. 739, Brief for the Company, page 10.

peculiar facts of the cases in which he conceived of the analogy, and suggested the "value" test. In the Reagan Case, the road concerned, the International and Great Northern, was in the receiver's hands. It had never paid a dividend and the stockholders had even been assessed to meet the charges on the bonds. The bondholders had been forced to fund accrued and defaulted interest in junior securities. Yet the stocks and bonds originally issued ($25,000,000), according to the figures which the Court accepted, "represented value." The Supreme Court opinion simply held that rates already insufficient should not be further reduced. There was no discussion of how the "value" of the road was determined, or what was the relationship of rates to that "value." In fact, though reductions in rates were assumed to reduce "value" in one portion of the decision, elsewhere the Court reasoned as if "value" were intrinsic.[1]

Similarly the "facts" accepted by Justice Brewer in Ames *v.* Union Pacific, which, from one viewpoint, might have been expected to indicate the circle in the "value" test, in fact eliminated the necessity of fixing upon "the actual value." For it was held by both Justices Brewer and Harlan that the reduction in rates would generally have meant no contribution by intrastate traffic to payments of interest on bonds, or dividends on stock.[2]

The unpreparedness of the Court to sift the evidence critically is indicated by the quality of that evidence. Calculations offered were accepted without that spirit of challenging skepticism found in the decisions of a later day.[3] But the *onus* must rest less upon the Court than upon

[1] 154 U.S. 362, 410, 411.

[2] Ames *v.* Union Pacific, 64 Fed. 165, 186, 187; Smyth *v.* Ames, 169 U.S. 466, 543.

[3] The best expression of this critical attitude is found in Justice Holmes' opinion in the Louisville Telephone Case, 225 U.S. 430, 436. See, however, Northern Pacific Ry. Co. *v.* North Dakota, 236 U.S. 585; Norfolk & Western Ry. Co. *v.* Conley, 236 U.S. 605.

the attorneys for the State, and their "expert" witness, "a gentleman," in Justice Brewer's phrase, "whose competency and credibility" were "unchallenged." "From the labyrinth of tables, figures, and estimates presented in the testimony" the Court selected tables prepared by the Secretary of the Nebraska Board of Transportation, as "the basis for some fair calculations."[1] The amount of income received from local freight business in the three years, 1891, 1892, and 1893, was accepted as reported by the carriers to the State Board, and the reduction, had the rates prescribed by law been in effect during those years, was determined by deducting 29.5 per cent from these amounts.[2]

This 29.5 per cent was the unweighted arithmetical average of the percentage reductions in each of the ten classes of traffic, for which rates were prescribed by law. Not only was there a wide spread in the figures which were averaged (the deduction in Class E rates being the lowest, 19 per cent, that in Class 5 being the highest, 35 per cent), but the witness testified that the reduction in rates on live stock, wheat, flour, and grain, "locally the principal items," had been only 14 per cent, etc.[3] In the face of this testimony the "average reduction" was made for all roads in each year, though the distribution of traffic from year to year on each road, even assuming that all traffic was handled under the class rates, could hardly have been uniform. This erroneous analysis was followed by the

[1] 64 Fed. 165, 179.

[2] 64 Fed. 165, 187. For a discussion of the expedient of making calculations on the basis of previous business, see H. S. Smalley, *Railroad Rate Control*, page 60. Professor Smalley did not, however, indicate the remarkable process by which the figure of 29.5 per cent was secured.

[3] Testimony of Mr. Dilworth, the Secretary of the State Board, Record, Ames *v.* Union Pacific (Smyth *v.* Ames, 169 U.S. 466), page 398; see page 637. The figures which were averaged were the following percentage reductions: First Class, 30; Second, 27; Third, 26; Fourth, 29; Fifth, 35; Class A, 32; B, 34; C, 32; D, 31; E, 19; — an average (ten classes), of 29.5 per cent.

attorneys for the State, and therefore naturally enough by both Justices Brewer and Harlan.[1]

That the assumed reduction of 29.5 per cent in the rates would have lessened the "value" of the railroad seems not to have been considered. There was no attempt to bring together the analogy between regulation and condemnation, and the hypothesis which insisted upon the effect of reductions as lessening earnings, since the volume of traffic was not conceived of as increased.

Justice Holmes, indeed, once barely avoided the logical trap set by the "valuation" doctrine, when, in Knoxville Water Company *v.* Knoxville, the complainants alleged that a rate reduction had been made in order to cut down the value of the plant preliminary to public purchase.[2] If this plea were accepted, and "value" maintained as a test for both purposes of regulation and condemnation,

[1] Brief of J. L. Webster for the State, pages 18, 84. Ames *v.* Union Pacific, 64 Fed. 165, 183; Smyth *v.* Ames, 169 U.S. 466, 535.

No more sound was the calculation of expenses. Justice Brewer took the Nebraska operating ratio, which covered both passenger and freight operations; assumed that the ratio on Nebraska intrastate business would exceed the general operating ratio on all business " probably 10 per cent up to 20 per cent" — possibly higher, though this amount was "not like" the calculation of the effect of reduction of rates on earnings, "where the figures and per cents" were "accurate and certain," etc. 64 Fed. 165, 182–86.

Justice Harlan insisted on adding 10 per cent to the operating ratio to show "due regard" to the testimony (that of Mr. Dilworth, and of Mr. Henry Fink), the Court's only "basis for judgment." He then drew up a table to show "at a glance" the effect of the rates under consideration. For example, the Burlington road in 1892 had an operating ratio of 64.23 per cent (this figure appears also in the *Statistics of Railways* for that year, page 385). Adding 10 per cent to cover the extra cost of doing intrastate business, though both interstate and intrastate business were handled on the same trains, and though the intrastate rates were on a higher level, a cost figure of 74.23 per cent was secured. Since earnings had been reduced to 70.50 per cent of their former level, an operating loss equal to 3.73 per cent of the former intrastate earnings was calculated. 169 U.S. 466, 530–36. Similar calculations are found in N.P. Ry. Co. *v.* Keyes, 91 Fed. 47, 55.

[2] 189 U.S. 434.

regulation must cease. Any reduction in rates, other things remaining the same, would lower the value of the property which must be the measure of reasonableness. Consciously or unconsciously the Court begged the question: "We may assume with the Supreme Court of Tennessee that if the rates were reduced *unreasonably*, a judicial remedy would be found. We may assume further that an attempt to affect the price of the company's plant in that way, if the city should elect to purchase, would not be allowed to succeed." [1] And later, in a rate case, referring to this passage Justice Holmes added, "of course, as we indicated the other day . . . if an attempt were made to cut down values, by the reduction of rates, the courts would know how to meet it." [2] These two citations, which, it would seem, evade the issue, can hardly be explained except on the ground that the Court was reasoning (unknowingly, to be sure) without regard to the vicious circle. At all events, in the Minnesota Rate Cases, Justice Hughes, in an opinion otherwise remarkable for its original and clean-cut thinking, could pass over the difficulty with the use of citations.[3]

II

But, if the capitalization of earnings be rejected, what rules do govern the determination of "fair value"? None

[1] 189 U.S. 434, 438. The italics are the writer's.

[2] San Diego L. & T. Co. *v.* Jasper, 189 U.S. 439, 443.

[3] 230 U.S. 352, 434. The perpetuation of the "valuation" test by the Supreme Court can in part be ascribed to the accident that a California statute directed certain local bodies having control over water rates to "estimate as nearly as may be the value," etc. In San Diego L. & T. Co. *v.* Jasper, 189 U.S. 439, Justice Holmes identified this provision with the "value" rule of the Supreme Court (page 442). See also San Diego L. & T. Co. *v.* National City, 174 U.S. 739, 757; and Stanislaus County *v.* S.J. & K.R. Canal Co., 192 U.S. 201, 215. This series of cases Justice Hughes cited, together with Knoxville *v.* Knoxville Water Co., 212 U.S. 1, and Willcox *v.* Consolidated Gas Co., 212 U.S. 19, which were based upon the Smyth *v.* Ames decision and the California cases.

— "the ascertainment of that value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment . . . of all relevant facts." With these words Justice Hughes took up the problem in the Minnesota Rate Cases.[1] Yet so long as "reasonable" qualifies the scope of judgment, as well as the "value" sought for, it can hardly be said that the Supreme Court has ever committed itself to the "valuation" test in unequivocal language. Certainly "exchange" value is not meant.

Justice Hughes, indeed, subscribed to an inquiry the scope of which was "thus broadly described" in Smyth *v.* Ames:

> "In order to ascertain that value the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."[2]

Clearly this, the "rule," "the judgment of the Supreme Court of the United States,"[3] has been received too seriously. Whoever shall make a "reasonable judgment" of the "fair value" must take into account a series of irreconcilable forces: investment, "cost of reproduction," the

[1] 230 U.S. 352, 434. In the fifteen years 1898–1913, no railroad case involving "value" as an issue had come to the Supreme Court. Thus the Minnesota Rate Cases looked back to Smyth *v.* Ames.

[2] 169 U.S. 466, 546, quoted, 230 U.S. 352, 434.

[3] Eastern Advance Case of 1910, 20 I.C.C. 243, 256. Commissioner Prouty also here referred to the paragraph quoted as "the law . . . never . . . qualified" (page 257).

commercial valuation, the probable net earnings — even any other facts which he may believe relevant. The resultant is the "reasonable value." [1] The impossibility of making practical use of the "rule" appeared when first such attempt was made. In Chicago, Milwaukee and St. Paul Railway *v.* Tompkins, Judge Carland quoted Justice Harlan, continuing: "Here is the rule, and the only question for the Court now to ascertain is, what is the fair value of the railroad property." After hearing a mass of contradictory testimony on "cost of reproduction," which was "not less than cost," the amount and the market value of the stocks and bonds, etc., the Court found that the only way to fix the "reasonably fair value" of the complainant's property was "by estimating, by guessing." So Judge Carland made his "guess." [2]

Instead of stating a "rule," expressing a "judgment," the truth is rather that Justice Harlan, to avoid committing the Court to a single standard of "value," — it must be remembered that the task of determing upon "fair value" was not faced in Smyth *v.* Ames and that the "rule" represents mere *dicta*, — included every element which entered into the record of the case at any point. The amount of the investment had been urged by the attorneys of the Union Pacific as the basis upon which to calculate a "fair return." [3] Or as an alternative they suggested the amount of the outstanding capitalization. [4] "Cost of re-

[1] "The reasonable value of the property is not determined by the amount of outstanding bonds, the amount of stock, the replacement value, nor by the earning capacity, but is determined by a consideration of these elements in the evidence when their bearing on the question of value is fairly considered." Judge Clark, Knoxville Water Co. *v.* Knoxville, page 296, Record, Knoxville *v.* Knoxville Water Co., 212 U.S. 1.

[2] 90 Fed. 363, 369. The Brief of G. R. Peck and A. B. Kittredge on appeal, objecting to the lower court's "guess," spoke of the "rule laid down by this court in Smyth *v.* Ames." Brief for the railroad, page 12, C.M. & St.P. Ry. *v.* Tompkins, 176 U.S. 167.

[3] Ames *v.* Union Pacific, 64 Fed. 165, 177.

[4] Smyth *v.* Ames, 169 U.S. 466, 544. See Argument of W. J. Bryan, page 489 and following.

production" (which was below the "values" suggested by the roads) was the standard proposed by the State. "There is only one true rule to go by," it was urged; "railroad property must be valued as all other kinds of property, at what it would cost to reproduce the road, or one similarly situated." The burden of "injudicious contracts, poor engineering, rascality" should rest upon the railroad.[1] No evidence bearing on the market value of the securities appeared in the record, and its inclusion is an addition made by Justice Harlan. The inquiry concerning probable earning capacity and operating expenses may be fairly assumed to have led the Court to identify, for the moment, the process of determining the amount of net earnings with that of fixing upon a standard by which to measure the reasonableness of those earnings.

There is one other ground, besides that of the intricacy and novelty of the problem, on which the inclusion of earnings and of the market value of securities can be explained. In a tax case decided some years previously, both Justices Brewer and Harlan quoted a statement of the Indiana Tax Commission, that it had "considered the cost of the construction and equipment, *the market value of the stocks and bonds, and the gross and net earnings*, and all other matters appertaining thereto that would assist the board in arriving at a true cash value."[2] To this series of items add the amount (par) of the securities, and the "cost of reproduction," both of which were introduced into the Smyth *v.* Ames record, and the "rule" is complete. It is quite within the realm of possibilities that Justice Harlan referred to this earlier opinion in which he had taken up the subject of "valuation." At all events, the similarity of language, even to the "all other matters," which as "other

[1] Brief of J. L. Webster, page 165, Smyth *v.* Ames, 169 U.S. 466. See also Brief of W. J. Bryan, in the same case, page 6; and Ames *v.* Union Pacific, 64 Fed. 165, 177, 178; and Smyth *v.* Ames, 169 U.S. 466, 549.

[2] P.C.C. & St.L. Ry. Co. *v.* Backus, 154 U.S. 421, 433, dissenting opinion, Justice Harlan, page 437.

matters" appeared in Smyth *v.* Ames, is striking, and probably not entirely without significance.

Some of the "elements" included in the "rule" have in practice been discarded.

Market value, the value of the railroad as registered in stock and bond quotations — the exchange value, in the phrase of the economist — has seldom appeared in the findings of fact upon which the courts have based the determination of "fair value." The reason assigned for thus passing over the figures with scant courtesy has, however, usually been that of impracticability. There has been no notice of the theoretical difficulty, the necessary dependence of the value of securities upon the regularity and amount of the income paid. Instead tables showing quotations, usually averages over a period of years,[1] have been introduced, commented upon briefly; and, be it said, unfavorably, then rejected with no apparent notice of the presence of the vicious circle. The stock and bond valuation has been held "unreliable" because including property not devoted to railroad purposes,[2] or because "subject to great fluctuation from causes wholly foreign to the intrinsic values of the properties." [3] Are not stocks especially subject to the "vagaries of speculation," reflecting the necessities of borrowers on collateral and not

[1] Record, Minnesota Rate Cases, 230 U.S. 352. Complainant's Exhibit 17 — Gray (N.P.); Complainant's Exhibit 67 — Drew (G.N.); Complainant's Exhibit 7 — Scott (M. & St.L.).

The Masters in the Alabama Cases were directed to report the "average market value" of securities during the years ending June 30, 1907, 1908, 1909. See Reports of W. S. Thorington, Special Master, Central of Georgia Case, page 75; Western Railway of Alabama Case, page 48; Reports of W. A. Gunter, Special Master; South and North Alabama Case, page 17; and Louisville and Nashville Case, page 48.

[2] Report of Chas. E. Otis, Special Master, page 240. Record (N.P.), Minnesota Rate Cases, 230 U.S. 352. Hereafter references to the Record in the Minnesota Rate Cases will be cited simply as: Minnesota Rate Cases, Record (N.P.); Record (G.N.); Record (M. & St.L.).

[3] Report of Chas. E. Otis, page 240.

facts useful in an investigation aiming to establish "fair value"? [1] The Master in the Minnesota Rate Cases found it "impossible to determine with any degree of certainty the particular elements which from time to time cause such fluctuations." [2]

Whether he realized the presence of a logical difficulty is very doubtful. For, after quoting Henry C. Adams to the effect that a commercial valuation could not be of service in a rate case, because of its dependence upon apparent income (the earning of interest on bonds and dividends), he said: "Valuation of properties for taxation would include all the properties of the corporation whether devoted to the public service or not, and in such case the market value of stocks and bonds issued by it would be an important element of value." [3] And with this obvious *non sequitur* the whole difficulty was waved aside. Justice Hughes merely commented that the Master was "undoubtedly right" in rejecting figures which included non-operating properties.[4]

In the Missouri Rate Cases, the lower court had accepted tax assessments (multiplied by three) as a measure of "fair value" [5] over the protest of the attorneys for the State. Among other things it was alleged that the Tax Board was required to take into account "the income of the property, and the income might be unduly high, and upon that basis give an unduly high valuation to the property." [6] In the Arkansas Cases, where the basis of taxation (doubled) was

[1] Consolidated Gas Co. *v.* New York, 157 Fed. 849, 870.

[2] The report of the Special Master (Record, page 211, Willcox *v.* Consolidated Gas Co., 212 U.S. 19) declared also that it was impracticable "to determine with any degree of accuracy what proportion of its outstanding capitalization represents its assets invested in the gas business."

[3] Report, page 240. [3] *Ibid.*

[4] Minnesota Rate Cases, 230 U.S. 352, 440. See also Judge Sanborn to the same effect, Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 802.

[5] St.L. & S.F. R.R. Co. *v.* Hadley, 168 Fed. 317, 323.

[6] Objection of F. W. Lehmann, for the State, quoted, Knott *v.* C.B. & Q. R.R. Co., 230 U.S. 474, 503.

also used, upon agreement of the parties,[1] District Judge Trieber had said: "The value of a railroad for taxation, it has been uniformly held by the courts, may properly be determined by the value of its bonds and stocks." [2] Since here the parties to the suit, the railroads and the State, had made formal stipulation that the calculations should be based upon the assessment for taxation, — the reasonableness of which was "of course conceded by the defendants," [3] — the validity of such method of determining "fair value" was not an issue before the Supreme Court.[4] But in the Missouri Cases, where no such formal stipulation had been made, Justice Hughes in specific language rejected the taking of tax valuations as "too general and inconclusive to be regarded as sufficient proof to sustain the values as found . . . when the principles governing the assessments may have rested upon methods which would be inadmissible in ascertaining the reasonable value of the property as a basis for charges to the public." What such methods would have been, the Court did not say.[5]

[1] The same stipulation was made by the roads concerned in the Alabama Cases: See Western Railway of Alabama *v.* R.R. Commission of Alabama, 197 Fed. 954, 970.

[2] *In re* Arkansas Rates, 187 Fed. 290, 319, with citations.

[3] *Ibid.*, page 310.

[4] Allen *v.* St.L.I.M. & S. Ry. Co., 230 U.S. 553, 556.

[5] Knott *v.* C.B. & Q. R.R. Co., 230 U.S. 474, 499–502.

The Interstate Commerce Commission has, however, expressed the opinion that the market value of the stocks and bonds may be useful evidence in fixing "value." Said Commissioner Prouty in the Eastern Advance Case of 1910, "We are not fixing the value of a collection of ties and rock and steel rails, but of a railroad equipped and doing business. What is that railroad worth as a railroad for the transaction of a railroad business? . . . Now the market value of the stocks and bonds of each of these carriers represents the sum which that property will bring in the open market. . . . It is the only way in which the value of these properties can be determined by the test of bargain and sale." (20 I.C.C. 243, 259.) Too much emphasis should not be placed upon what may well have been meant simply as a passing comment. As Commissioner Prouty later frankly stated, the discussion assumed the reasonableness of existing rates. He spoke also of this "value," being that "worked out in the actual operations of recent years in competition with its rivals," as "at least a

Nor has emphasis attached to the *par value* of the stocks and bonds. It was thought "fortunate" by the Railroad Securities Commission that the volume of securities was but one among many matters to be considered in a determination of "value." The "dictates of precedent" were thus made to "coincide with those of business sense." For "the attempt to make the face value of securities issued the determining factor in rates would result in putting a premium on roads which had been speculatively, not to say dishonestly, built or managed, by allowing them to charge higher rates on account of the inflated capital thus produced." [1] Indeed, the Supreme Court has now expressed entire skepticism of the usefulness of the amount of the capitalization as bearing upon the reasonableness of the return.[2]

The cost figures which have been presented to fulfill the demand of the "rule" have sought to measure the proceeds of securities. The Master in the Minnesota Rate Cases merely took the figures for the entire systems, as introduced by the company witnesses, and assigned the proportion to

strong index of the value of that property in comparison with other properties in this [Official Classification] territory." It would seem, however, that Mr. Prouty was thinking of the old problem of recognizing vested interests, involving ethical rather than economic considerations. Once the plant is built, investment in the securities of the company continues, though the creation of no new "capital goods" is thereby insured. Such transactions take place entirely apart from the operations of the railroad whose earnings simply accrue to new shareholders, who join the enterprise after the success of the enterprise is assured. The same income regularly accruing (in dollars) is capitalized at a lower rate with partial elimination of risk. The market value of the securities is greater. And it is at these higher prices that the purchases are made for "widows and orphans" seeking conservative investments, and for the institutions for which the "widows and orphans" may be said to stand. See the testimony of President McCrea, of the Pennsylvania, quoted, Evidence, 1910 Advances, page 5039.

[1] *Report*, Railroad Securities Commission (November, 1911), page 32.

[2] Smyth *v.* Ames, 169 U.S. 466, 544; Knoxville *v.* Knoxville Water Co., 212 U.S. 1, 11.

Minnesota which the total mileage in that State bore to the system mileage. This figure was "considerably less than the valuation of the physical properties as found," since it made "no allowance for appreciation of property incident to the growth or prosperity of the country in which the company is entitled to share." He recognized, however, that division on a mileage basis was "for the most part arbitrary and unreliable."[1] The lower court turned to the argument that cost five to forty years ago might be "evidence" of value in 1908, though it was "certainly no criterion."[2] The attorneys for the State insisted that this decision by the Master and Court meant "ignoring" original cost, not "considering" it. If the original cost be a "material element" in "fair value" — they too held to the "rule" in Smyth *v.* Ames, — "each of the complainants has failed to sustain the burden resting upon him, and the findings are insufficient to support the ultimate conclusion."[3]

[1] Report of Chas. E. Otis, page 241. There was no mention of improvements from earnings; nor was the character of the Minnesota lines as compared with the mountain construction considered. Even Justice Hughes did not challenge these figures. (230 U.S. 352, 441.) The testimony bearing on this aspect of the case is found in the Record (N.P.), page 259 and following, page 592 and following; Record (G.N.), page 1910 and following; Record (M. & St.L.), page 1.

[2] Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 803. See Brief for the Companies, Minnesota Rate Cases, page 131 and following.

[3] Brief for the State, Minnesota Rate Cases, page 126.

In the Spokane Case, Commissioner Prouty discussed at length the "original cost," as shown by the accounts, as well as the cost of reproduction estimates. 15 I.C.C. 376, 398 (N.P.); 403 (G.N.).

In the Knoxville Case, a figure of "invested value," purporting to indicate the cost of the various units of plant, was introduced by the company. This estimate, however, was purely an exploit of the imagination. "The books were not consulted at any time for prices of materials" (Record, page 838); the maker of the estimate "carefully avoided making use of, or referring to account books," but made his analysis upon "information and experience as engineer and expert" (page 635). The work of making this estimate (it purported to be accurate to the final cent) was done in Boston (page 811). Knoxville *v.* Knoxville Water Co., 212 U.S. 1.

See, however, the report of the Public Service Commission of Massa-

By an amendment to the Act to Regulate Commerce, passed in 1913, the Interstate Commerce Commission is assigned the task of "valuing" the railroads. A "physical valuation," supplemented by accounting investigation, is provided, the purpose being to examine the history and organization of each railroad, without emphasis upon the amount of the capitalization. Otherwise the Act of Congress follows the language and spirit of Smyth *v.* Ames in entirely orthodox fashion. The Commission is directed to "*ascertain and report in detail* as to each piece of property owned or used by such common carrier, the original cost to date, the cost of reproduction new, the cost of reproduction less depreciation, and an analysis of the methods by which these several costs are obtained, and the reason for their differences, if any"; in like manner, to "ascertain and report separately *other values, and elements of value,* if any, of the property of such common carrier, and an analysis of the methods of valuation employed, and of the reasons for any difference between such value and each of the foregoing cost values." [1] In this language the bill aims to cover "going value, good-will value, and franchise value"—"intangible values." [2]

But the statute commits Congress to no theory of "valuation." The entire burden of weighing "the elements of value" is thrown upon the Commission, which presumably possesses the technical knowledge to cope with the problem. Before a "tentative valuation" can become "final," however, the Commission must notify the carrier concerned, the Attorney General of the United States, the

chusetts, "The Middlesex and Boston Rate Case," where it was held that *under Massachusetts law* the honest and reasonably prudent investment, represented under normal conditions by the capitalization, must be taken as the basis of reckoning fair and reasonable rates. *Second Annual Report,* Public Service Commission of Massachusetts, volume 1, page 99.

[1] Section 19a, the Act to Regulate Commerce.

[2] "Valuation of the Several Classes of Property," etc. *Senate Report,* 1290, 62d Congress, 3d Session (hereafter cited as "Senate Report on Valuation"), page 8.

Governor of any State in which the road's property may lie, and even "such additional parties as the Commission may prescribe," stating the amount of this "valuation." If no protest is lodged within thirty days, the "said valuation" becomes "final." But where protest is filed, the Commission must hold hearings, to consider any relevant matter presented in support of the protest; and, if of the opinion that the "tentative" valuation should not be made "final," may "make such changes as may be necessary." Altogether the task of the Commission would not seem a happy one. To apply Smyth *v.* Ames in a way that shall satisfy the railroads, the Attorney General of the United States, and above all the Governors of forty-eight States, with their local railroad commissions, is difficult enough. But what of the courts?

The act is framed to limit the judicial interference with the independent determination of "fair value" by the Commission. All "final valuations" fixed under the provisions of the statute ("and the classification thereof," i.e., cost, "cost of reproduction," etc.) "shall be *prima facie* evidence of the value of the property in all proceedings under the Act to regulate commerce . . . and in all judicial proceedings brought to enjoin, set aside, annul, or suspend, in whole or in part, any order of the Interstate Commerce Commission." Where evidence is introduced "different from that offered upon the hearing before the Commission or additional thereto and substantially affecting said value, the Court before proceeding to render judgment shall transmit a copy of such evidence to the Commission, and shall stay further proceedings in said action for such time as the Court shall determine from the date of such transmission." But the Commission is not required to rescind or alter the original figure of "final value." It must consider the new evidence, and it may report an "altered, modified, or amended" order, upon which "judgment shall be rendered, as though made by

the Commission in the first instance." But if the original order is not rescinded or changed by the Commission, judgment will be rendered upon the original order. The theories of "valuation" of the Interstate Commerce Commission are those which shall govern.[1]

The decisions of the Commission do not, however, indicate a reasoned theory of "valuation." The "judgment" of the Supreme Court has been quoted; there has even been discussion under each of the several heads; but there has been an expressed realization of the "indefiniteness" of the "law." Commissioner Prouty (the Eastern Advance Case of 1910) had only to repeat a complaint he had voiced eight years previously:

> "It is plain that until there be fixed, either by legislative enactment or judicial interpretation, some definite basis for the valuation of railroad property and some limit up to which that property shall be allowed to earn upon that valuation, there can be no exact determination of these questions. In the absence of such a standard the tribunal, whether court or commission, which is called upon to consider this matter, can only rely upon the exercise of its best judgment."[2]

Congress, however, when the opportunity to establish a "definite basis" was before it, was guilty of the same lack of explicitness which has characterized the decisions of the courts. The burden of responsibility has been shifted to the Commission. That body, overworked before, must fix "final valuations" and "the classification of the elements that constitute the ascertained value." The evidence it shall consider includes "the original cost to date, the cost

[1] Section 19a, the Act to Regulate Commerce.

[2] Eastern Advance Case of 1910, 20 I.C.C. 243, 261. The quotation is from the Advance Case of 1903, 9 I.C.C. 382, 404; and, considering the seriousness with which conjectural "valuation" figures were discussed by the Interstate Commerce Commission in the Spokane Case, and in the Western Advance Case of 1910, it cannot be said that that body has treated the problem with scientific rigor. See discussion, below, pages 53–54.

of reproduction new, the cost of reproduction less depreciation . . . other values and elements of value." [1] It is difficult to see wherein, if at all, the Valuation Act represents an advance over the "rule" in Smyth *v.* Ames.

[1] See *Senate Report on Valuation*, pages 8 and 9, and Section 19a, the Act to Regulate Commerce.

CHAPTER II

PHYSICAL VALUATION
"COST OF REPRODUCTION" — LAND

STUDY of "physical valuation," from the point of view of economics, cannot concern itself with the technical engineering problems. The measurement and count of the properties and the classification of the various units of quantity must be left with the engineer. The economist is interested in the result as set forth in the total for the appraisal. He can insist, in the first place, that the figures finally presented shall not set claim to an accuracy that is specious; and, in the second place, that figures secured on fallacious hypotheses shall not be introduced as a basis for an attempted solution of an economic problem. But with the engineering aspects, *per se*, he is not concerned.

The appraisals made have sought to determine, not the volume of the unimpaired investment (of "unripened" savings) represented by the plant, but "cost of reproduction," with deduction made to take account of accrued depreciation. The consideration of the theoretical justification for this basis, or the lack of such justification, is a matter of subsequent discussion. In this, and the succeeding chapter, the accuracy of the figures secured will be considered.

I

"Cost of reproduction" may be defined as the estimated investment necessary to duplicate an existing railroad, not to create a substitute plant equally effective.[1] This definition, itself simple, involves certain vigorous hypotheses. The road bed is assumed to disappear, and in place of the smoothed and well-tended grade the conditions met at the time of construction are restored. The right of way and terminal properties pass into private hands to be devoted to the same use as adjoining tracts. The equipment vanishes, the working force is scattered. The very corporate existence ceases.

But the process of reversion stops here. Any other railroad serving the same section, either as a parallel and competing line, or as a terminal connection, remains untouched, available to transport materials of "reconstruction." And these materials are drawn, not from the sources originally used, but from those now available. The population, rural and urban, does not desert the line of the road; busy factories and warehouses stand at the edge of a primeval right of way, which is overgrown with trees and underbrush. Everything awaits the advent of the courageous promoter who shall place surveying parties in the field, secure a charter, arrange financial matters: in short, set out to restore the plant of the road which in imagination has been made to disappear, yet which in fact exists. What will it cost? And, having the "cost of reproduction new," how much of this "investment" would be existing at a period in the future with the new hypothetical units as old

[1] See James E. Allison, "Ethical and Economic Elements in Public Service Valuation," *Quarterly Journal of Economics*, volume 27, page 27; the Brief filed with the Interstate Commerce Commission, on behalf of the railroads represented in the Presidents' Conference Committee, hereafter cited, as the "Valuation Brief of 1915"; and statement of Pierce Butler, Valuation Conference of September 30, 1915, *Proceedings*, page 12 and following.

and in the same physical condition as those now in place? The answer to this question is the engineer's "present value," the "cost of reproduction less depreciation." [1]

The Interstate Commerce Commission, which is directed to determine the "cost of reproduction new," and the "cost of reproduction less depreciation," does not enter upon an untouched field. Entirely aside from the appraisals made by individual carriers to furnish evidence in rate cases, "as the Supreme Court in the case of Smyth *v.* Ames" has told them "to do," [2] no less than eight States have made

[1] This definition of the "cost of reproduction" is based upon the necessary assumptions made in order to account for the items included in the appraisals made. See testimony of D. C. Morgan, the Chief Engineer of the Minnesota Commission, Minnesota Rate Cases, Record (N.P.), page 1762; of W. L. Darling, the Chief Engineer of the Northern Pacific, *ibid.*, page 5 and following; of A. H. Hogeland, of the Great Northern, Record (G.N.), page 2 and following; and of J. F. Stevens, *ibid.*, page 466. See also, *Proceedings*, Valuation Conference of May 27–29, 1915; the Valuation Brief of 1915; and the Reply Brief filed on behalf of the National Association of Railway Commissioners, page 18 and following.

[2] Quoted from Mr. Jared How, of counsel for the railroads, Minnesota Rate Cases, Record (N.P.), page 14. The railroads here introduced "cost of reproduction" estimates for the Minnesota mileage and those for the entire Northern Pacific which had been presented in the Spokane Case (Spokane *v.* N.P. Ry. Co., 15 I.C.C. 376, 395) by W. L. Darling, the Chief Engineer of the Northern Pacific, Record (N.P.), pages 5–121, 534–90, 936–1023, 3207–47; and by J. B. Berry, then Chief Engineer of the Rock Island, *ibid.*, pages 718–904; of the Great Northern, by A. H. Hogeland, its Chief Engineer, Record (G.N.), pages 2–162; 990–1077; 1557–1734; of the M. & St.L., by A. S. Cutler, Record (M. & St.L.), pages 909–52.

The Alabama lines of the Central of Georgia, the Western of Alabama, the South and North Alabama, and the Louisville & Nashville were "valued" by their engineers for the Alabama Rate Cases. Report of W. S. Thorington, Special Master, in the Central of Georgia Case, page 109; in the Western of Alabama Case, page 56; Report of W. A. Gunter, Special Master, in the South & North Alabama Case, page 46; in the Louisville & Nashville Case, page 83.

J. F. Stevens, then Vice-President of the New Haven, had charge of an appraisal of that road as of the year 1907. See his testimony, Minnesota Rate Cases, Record (G.N.), page 462. This "valuation" was subjected to what would appear to be a perfunctory check by G. F. Swain, acting for the Massachusetts "Validation" Commission. Report of

similar investigations. The very existence of these figures automatically refutes the skeptic who is satisfied that to establish the "cost of reproduction" is an attempt to do the impossible.[1] How reliable the results of such appraisals have been, and how much worth while any such figures promise to be, are, however, entirely different questions.

Massachusetts Joint Commission on the N.Y.N.H. & H., 1911. (*The New Haven Validation Report.*) W. J. Wilgus made an appraisal of the Lehigh Valley, introduced in Lehigh Valley *v.* U.S., 204 Fed. 986, 988.

At the conferences between the engineers representing the Interstate Commerce Commission and the railroads, it developed that other lines had made "valuations" of portions of their plant; Valuation Conference of September 4 and 5, 1913, *Proceedings*, page 3 (H. C. Phillips, of the Santa Fé); page 9 (E. Holbrook, of the Southern Pacific); page 11 (G. W. Kittredge, of the New York Central); page 21 (J. B. Berry, of the Rock Island); page 23 (C. H. Smith, of the Missouri Pacific).

The C.B. & Q. was the only road to make formal attempt to introduce a "cost of reproduction" estimate into the record of the 1910 Advance Case (Evidence, 1910 Advances, page 978 and following, the testimony of F. E. Ward, the General Manager). See, however, the testimony of Wm. Ellis, who "conservatively" appraised the entire line of the C.M. & St.P. by using the State appraisal figures for Wisconsin, Minnesota, and South Dakota, calculating Illinois on the Wisconsin basis; Iowa on the Minnesota basis, etc., securing a "net total of $293,318,968.02" (pages 658 and 5786); of E. P. Ripley, who testified, "not stating it merely as an opinion" (he had "reasons for believing and knowing it"), that the Santa Fé "could not be reproduced, to-day, for its capitalization" (page 21); etc.

[1] The official State appraisals have been made in Texas (see paper by R. A. Thompson, Chief Engineer, *Transactions*, Am. Soc., C.E., volume 52, pages 328, 360); in Michigan (Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 76, the report by M. E. Cooley who made the appraisal); in Wisconsin (*ibid.*, page 82, the report of W. D. Taylor, Chief Engineer); in Minnesota (*Supplement, Report*, Minnesota Railroad & Warehouse Commission, 1908); in South Dakota (*Twenty-first Annual Report*, Board of Railroad Commissioners); in Nebraska (*Fourth Annual Report*, State Railway Commission); in New Jersey (*Report on Revaluation of Railroads and Canals*, 1911); and in Washington (*Second and Third Annual Reports*, published as a single volume by the State Railroad Commission). The less important lines have been appraised in Oregon and California, while Kansas has discontinued work in view of the Federal appraisal, though an appraisal of the lines of the Union Pacific had been made. (*First Report*, Kansas Public Utilities Commission, 1912.) The valuations in Michigan, Wisconsin, and New Jersey were for taxation.

II

Three general groups of items may be considered as they would appear in the inventory: land, covering the right of way and terminals; the permanent way, structures and equipment; and the "overhead" or general expenses. Logically the appraisal of the railroad site may be separated from the appraisal of the plant made by man — the economist's "capital goods." Its acquisition is an essential first step; and the considerations of principle presented are necessarily different in character, since land is not, like the items of plant, freely reproducible. Neither does it "wear out." Moreover, here the measurement of quantities is relatively simple. It is a problem in two dimensions, where the degree of error due to inaccurate surveying promises to be negligible. And, in addition, the holdings of land are, it may be assumed, largely a matter of record, in the offices of the railroads, or in the public files. The number of acres and square feet of land occupied by the railroad may, therefore, be considered as determined within a relatively narrow range of error.

But though land cannot be "reproduced," it can be reacquired. Keep clearly in mind the details of the hypothesis which bear upon this aspect of the problem. Title has passed from the railroad company to private owners, who are supposed to devote the land to the same purpose as that for which the adjacent land is used. This holds true, even though, for the purpose of "reproducing" the "clearing and grubbing," it be necessary to assume the presence of the forest long since cleared away. In the country the land is used for farming (where available for tillage or pasture); and in the cities there is insistence that the sites be devoted to trading, warehouse, factory — even residence purposes.[1] Thus the land needed by the railroad

[1] The following statement of Mr. Jared How, of counsel for the railroads in the Minnesota Rate Cases, is typical: "What we are trying to

does not stretch in a long vacant tract through country and city. By the same token that the existing line is conjured out of sight, buildings are conjured into its place. Making these assumptions, which, to the lay mind, may seem strenuous, the investigator has courageously set about to estimate what it would cost the railroad to reacquire the land it already possesses.[1]

The presence of imaginary buildings has only in part been the justification of the use of a multiple of the "true market value" of the land in order to determine its "cost of reproduction." The multiple has been justified also on the ground that it is a matter of "common knowledge" that the railroad buying land in a narrow strip pays more for it than the "true value," the "market value" for farming,

establish is the value of the Northern Pacific Railway System as the base upon which we are entitled to a fair return, if we are entitled to anything. The Supreme Court, in the case of Smyth *v.* Ames, the utterance being by Mr. Justice Harlan, says that one of the elements to be considered is the present cost of construction of the property as it exists in operation for the public use. Some other courts have said that that was the sole element to be considered. Now, the present cost of construction of the Northern Pacific Railway may be established only, of course, by considering that the railway property does not now exist. In establishing the present cost of construction of the railway, the first element, manifestly, is the cost of acquisition of the railway right of way; if no railway property now exists, manifestly the right of way must be first acquired, and the only method of computing the present cost of construction is to start upon the proposition that the property does not exist, because, if it does, you can't presently construct it. Now, that being the fact, we must, of course, establish the present cost of acquisition of the railway property, not upon the hypothesis that the Indians infest St. Paul, but on the hypothesis of the present conditions of St. Paul and all other points of contact." Record (N.P.), page 1067.

[1] The testimony of Thomas Cooper, of the Northern Pacific, — Minnesota Rate Cases, Record (N.P.), pages 196–97, — illustrates well the significance of this thesis. Probably the most extreme instance of conjuring up buildings, however, came before the New York Public Service Commission, 1st District, in *Re* Metropolitan Street Ry. Reorganization, 3 P.S.C. 1st D. N.Y. 113, where it was assumed that modern buildings would be torn down to make way for a one-story car barn covering the city block bounded by Fourth and Lexington Avenues, and 32d and 33d Streets (pages 139–40).

business, or residence purposes, since an element of damage attaches to the division of a tract into two portions, etc.[1] A higher price paid by the railroad would seem, moreover, an invariable concomitant of the use of the jury in condemnation cases. Whether the damage be real or imaginary, the result is certainly the same. The company acquiring land does usually pay more than its value in the service in which the land was formerly used. Indeed, the railroads, having this knowledge born of long experience, resort to condemnation only when forced to do so. It is more economical to make purchases at agreed terms.[2]

Multiples, then, were used in both the Michigan and Wisconsin appraisals, the first of the series of "valuations" made since 1900. And the precedent there established has persisted in the subsequent appraisals whether made by State or corporation employees. In no case, however, has there been attempt to attach the railroad land to specific adjoining tracts, and to measure the business shrewdness of the individual landowner by estimating how much or how little he would demand; or to gauge that of

[1] "The proper construction of the road often makes access from the land on one side to the land on the other more difficult. . . . The natural drainage is interfered with. Roads and streets may be closed or changed. The noise, smoke, danger, and inconvenience from the operation of railroads. . . . These considerations always make the right of way value more, oftentimes much more, than its market value for other purposes." Instructions to right of way appraisers, Wisconsin Appraisal; *Report*, Wisconsin Tax Commission, 1907, page 274.

See C. & N.W. Ry. Co. *v.* Smith, 210 Fed. 632, 638, quoting testimony of C. C. Witt, Chief Engineer of the South Dakota valuation.

[2] Thomas Cooper, Minnesota Rate Cases, Record (N.P.), pages 136–38; 244–46; Charles Hayden, Record (G.N.), pages 208–17. Mr. Cooper testified (pages 136–37): "We don't waste time looking for bargains. . . . I have gone as high as twice what I was satisfied in my own mind was a good liberal price, and if the party will not accept the increased price, we reluctantly resort to condemnation." See discussion by D. C. Morgan, the Minnesota State Engineer, in his report, page 17, *Supplement, Report*, Minnesota Railroad & Warehouse Commission, 1908; the Valuation Brief of 1915, pages 320–23; and Argument of Thomas W. Hulme, at the Valuation Conference of May 27–29, 1915, *Proceedings*, page 120 and following: containing a series of interesting instances.

the railway right of way agent. Nor has there been necessity to reproduce the appraising process of an endless series of juries. Prophecy has not been attempted where the personal element would vary so widely.[1] Instead the practice has been to take "average" figures, to use multiples of the "value of the land for other purposes," the size of the multiple being based upon investigation of the ratio of the amount paid by railroads in a given district as compared with what D. C. Morgan, the Chief Engineer of the Minnesota Commission, called "the true value" of the land. Since an "average" figure which could be applied generally has been sought, the necessity to consider the probable multiple in each acquisition has been eliminated. Some variation has, however, appeared. In Texas, 25 to 50 per cent was added; in Wisconsin, 10 to 150 per cent; [2] in Washington, 0 to 500 per cent (surely a vague "finding of fact"); [3] in Nebraska, the Chief Engineer added "a minimum of 50 per cent, and a maximum of 225 per cent," for rural right of way, and "a minimum of 25 per cent and a maximum of 100 per cent" for "town property." [4] In

[1] Mr. Cooper — Minnesota Rate Cases, Record (N.P.), page 137 — declared that when he ran across a man unpopular with his neighbors, the road "got off" with less. However, in condemnations "you run across reasons that increase the award against you that you never dreamed of. You will find sentimental reasons — an old home or associations, births, deaths, and marriages. The woman will get on the stand and she will tell her story and weep over it, and every tear costs us money; therefore condemnations I dread. . . ."

[2] Mr. R. A. Thompson (Texas), discussing the Wisconsin figures, declared that the multiple used in Wisconsin for country lands (250 per cent — an addition of 150 per cent) appeared "quite fair," but in cities . . . "too high," especially for the Southwest. *Transactions*, Am. Soc., C. E., volume 72, page 205. See discussion by Mr. Taylor, of Wisconsin, on a paper by Mr. Thompson, on "Valuation of Railroad Property," *Transactions*, Am. Soc., C. E., volume 52, page 353.

[3] *Second and Third Annual Reports*, Railroad Commission of Washington, page 157 (N.P.); "findings of fact" covering each parcel of real estate are given in terms of dollars, so that the exact multiple used does not appear for each item.

[4] *Senate Report on Valuation*, page 176.

South Dakota, where the multiple was found "to range from 2 to 5, the average being about 3 outside of towns," a multiple of $2\frac{1}{2}$ was used for all lands, town or country. A similar general average was used in Minnesota, though in the three "terminal cities," lower multiples were applied than in the country.[1] The railroad appraisals, presented in the Minnesota Rate Cases, used the multiple of 3 for country right of way; but this the Master cut to $2\frac{1}{4}$. In the cities he allowed an addition of 5 per cent, over the insistence of the railroads that 5 per cent was only a minimum, that the actual extra cost was 5 to 40 per cent.[2] In the Western Advance Case of 1910 the General Manager of the Burlington testified that his estimate of the "cost of reproducing" the land included a multiple of 3 over the whole line, except in principal cities.[3]

Thus, entirely aside from the method of securing the "market value" or "true value," to which the multiple or percentage has been applied, considerable variation in practice has appeared. There has been unanimity only in the insistence that the multiple be used. How large it should be, to which classes of land it should be applied — these are factors which, it must be clear, have depended entirely upon the judgment of the individual appraiser. The use of a general average, or of a series of such averages, moreover, has constituted resort to approximation, an expedient which will often appear in the subsequent discussion.

Justice Hughes in the Minnesota Rate Cases condemned the use of multiples, in part upon the technical ground that it was impossible to assume, "in making a

[1] *Supplement, Report*, Minnesota Railroad & Warehouse Commission, 1908, page 15; in St. Paul, the multiple was $1\frac{3}{4}$; in Minneapolis, $1\frac{5}{8}$; in Duluth, $1\frac{1}{4}$; *ibid.*, page 17. The country "multiple" was 3.

[2] Report of Chas. E. Otis, Special Master, Minnesota Rate Cases, pages 220–24.

[3] Evidence, 1910 Advances; testimony of Mr. F. E. Ward, of the C.B. & Q., pages 998–1011.

judicial finding of what it would cost to acquire the property, that the company would be compelled to pay more than its market value"; in part upon the ground that such a multiplier covered a "hypothetical outlay." Accordingly Justice Hughes pronounced the opinion of the Court that "the allowances made below for a conjectural cost of acquisition and consequential damages must be disapproved."[1] This action, of course, meant a wrench to the "cost of reproduction" theory, in fact a significant departure from the regulation-condemnation analogy. It was intended as such: "The conditions of ownership of the property and the amounts which would have to be paid in acquiring the right of way, supposing the railroad to be removed, are wholly beyond reach of any process of rational determination. The cost of reproduction method is of service in ascertaining the present value of the plant when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon mere conjecture."[2]

III

Turn now to the problem of determining the "true value" of the railroad lands. Resort has been made to court practice in condemnation cases: to reliance upon the prices paid for adjoining tracts, or upon the opinion of experts. Sometimes, indeed, a "sales and assessment" formula has been evolved, reference being made to taxation records. But every one of these expedients has proposed that the measure of the cost of reacquiring the railroad land be the

[1] Minnesota Rate Cases, 230 U.S. 352, 455.

[2] *Ibid.*, page 452. What would seem to be positive language has, however, not been accepted as final by the attorneys representing the railroads in the Federal valuation. They have insisted that "cost of reproduction" which the Commission is directed to determine can be estimated in no other way. Valuation Brief of 1915, pages 315–70.

value of adjacent tracts. The logical complication due to the relation of the presence of the railroad — its effect upon economic rent, and therefore upon the value of the adjacent tracts — has been ignored.

In Michigan special inspectors, "experts in land values," submitted reports "so complete as to leave no doubt of the thoroughness of their investigation." This investigation depended upon the information submitted by "a large number of citizens who very courteously entered upon the task of filling out the blanks requesting information as to the value of properties in their respective localities"; supplemented by "as much personal inspection as it was possible for a few men to give in a limited time." The result was a series of average "values" for various classes of land — farm land, barren land, land in villages of less than 500, etc. It then became necessary to classify the amounts of each kind belonging to the several roads. "In this much assistance was received from the local engineers (i.e., locomotive engineers), who, on account of their familiarity with their runs, were able to give, with considerable accuracy, the extent of the lands of different grades on their respective lines." [1] Prices established, the acreage of each classification determined upon in this hit-or-miss method, it was a simple task to figure a cost of reacquiring land, set down as if correct to the last dollar. To the totals here secured were added expert appraisals, based upon investigation of sales records, of lands in the principal cities.[2]

[1] M. E. Cooley, Michigan Railroad Appraisal, Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 77.

[2] See H. E. Riggs, "Valuation of Public Service Corporation Property," *Transactions*, Am. Soc., C.E., volume 72, page 52.

In the Alabama Rate Cases, too, the largest dependence was placed upon the appraisals of "experts." Says Mr. Thorington, the Special Master in the Central of Georgia Case: "The right of way agents went over each mile of all the Alabama lines of the road, and from personal inspection of the right of way and adjoining property . . . and full conference with the owners of property adjacent to the road and with business

The Washington Commission also employed experts, "following the same general lines that would be pursued in court in an ordinary condemnation action." Men experienced in buying land for railroads made a personal inspection of "every line of road within the State, and every piece of property owned by the roads." In the larger cities the Commission hired "expert real estate men of high standing" who investigated all the holdings of the railroads in the cities, and subsequently testified before that body. The railroads introduced equally reliable (or unreliable) expert testimony: the Commission made "findings of fact" — probably no better nor worse than the Michigan figures, but certainly hardly more conclusive or serviceable. Unless, of course, it be assumed that the Washington Commission made its "findings of fact" with infallible insight, and that it hired a peculiarly infallible brand of real estate expert.[1]

men in towns and with real estate agents, and in some instances after examination of the records of conveyances for the county, fixed the value of the right of way property, the ultimate valuation in every instance being fixed after acquiring information as above stated, and also based on their experience." Report, page 117. See also his Report in the Western of Alabama Case, pages 62–63.

[1] *Second and Third Annual Reports*, Railroad Commission of Washington, page 49.

The following figures introduced by fourteen "experts," testifying to the value of the same piece of land, in a suit by a railroad company to condemn right of way in Minnesota indicate some of the extreme possibilities of expert testimony:

For Owners	For Railway
$76,808	$1,990
111,930	2,583
121,410	2,910
133,719	3,074
156,400	3,825
230,646	6,107
288,345	8,840

Cited, *Proceedings*, National Association of Railway Commissioners, volume 21, page 328.

In the New York Gas Case the real estate experts' estimates ranged from $19,663,507 (the State expert) to $15,499,500 (the Company expert).

In order to avoid this dependence upon expert testimony and "opinion," the "sales" method of appraising land has been used. When, in 1902, Michigan desired a check on the computations made two years before, employees were sent to the offices of the Registers of Deeds "in ten or twelve counties. . . . A careful abstract of all railway transfers for a period of ten years was taken off, the acreage determined, the average price for different classes of land computed, and then a careful study of transfers of adjacent improved and unimproved lands was made." [1] The results of this investigation were presumed to be better than those secured two years earlier. It is difficult to see how a ten-year average covering various classes of lands was necessarily more conclusive than the "average" value computed from the opinions of bankers as applied to a classification made by locomotive engineers. In the Wisconsin appraisal, Mr. Taylor placed dependence upon similar investigation of records of transfer, made under the direction, not of an economist or statistician, but of a professor of mathematics in the state university.[2] This method, with the subsequent addition of the assessment check, has since been generally used by the Wisconsin Commission.

The theory behind the use of the sales method is very well expressed in a report of the former Engineer of that body, Mr. W. D. Pence, later upon the staff of the Interstate Commerce Commission:

> "The sales method may be defined as a plan or process for the systematic collection and comparison of data relating to real estate transfers for the purpose of estimating true

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There were two figures of approximately twelve millions, and one of over fourteen. Report of Special Master, A. H. Masten, page 157, Willcox v. Consolidated Gas Co., 212 U.S. 19.

[1] H. E. Riggs, from whom this is quoted, was one of the investigators. "Valuation of Public Service Corporation Property," *Transactions*, Am. Soc., C.E., volume 72, page 54.

[2] W. D. Taylor, Wisconsin Railroad Valuation, Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 85.

> market realty values. It consists in a study of the transfers of neighboring property having conditions or characteristics similar to the land whose value is to be determined, and is intended to duplicate, as nearly as may be, the mental or judicial processes ordinarily employed by the so-called 'local real estate expert,' with a view to arriving at results approximating those which would be reached by such local expert acting without bias or suggestion."

The sales and assessment method, on the other hand, is designed to introduce, "as far as may be, the judicial processes of the assessor who, at least in theory, serves on behalf of the public as an unbiased expert." The sales method attempts to duplicate "the mental process" of the expert; the sales and assessment method, the "judicial process of the assessor" — in neither case a promising recommendation.[1]

The Minnesota Rate Cases presented the problem of appraising lands as a significant issue. Here the companies based their claims upon expert testimony, and the State upon the sales method, except in the three cities of Duluth, St. Paul, and Minneapolis, where the sales and assessment method was used. In the record of this case, therefore, the relative advantages and disadvantages of the different methods can be sought out. In no instance does it seem that a degree of accuracy was promised which would warrant acceptance of the results in a scientific analysis, quite apart from any challenge of the premises, themselves.

The "valuation" of 1907 made for the Minnesota Railroad and Warehouse Commission was for the ostensible purpose of using the figures secured as the basis of measuring the reasonableness of the return to the railroads from intrastate business.[2] In all essential aspects, however, the

[1] State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 528–33; also Hill *v.* Antigo Water Co., 3 W.R.C.R. 623, 670; and Buffalo Gas Co *v.* City of Buffalo, 3 P.S.C. 2d D. N.Y. 553, 643.

[2] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 1972.

appraisal was upon the same basis as the Michigan and Wisconsin appraisals, which had been made for taxation purposes. The "valuation" of the lands outside the cities is hardly significant for the present discussion.[1] Chief Engineer Morgan's letter of instruction to the special land agents directed an examination of the record of transfers of real estate subsequent to January 1, 1900 (though the appraisal was as of June 30, 1907), "obtaining therefrom all transfers within one and one half miles on each side of the center line . . . and in such instances as the records do not show sufficient activity in the sale of property to enable intelligent and fairly complete data," extending the inquiry to sales beyond the one and one half mile line. Besides this examination of the records, "inquiry among real estate men, bankers and business men" was directed "to enable confirmation of the data obtained from the county records."[2] These instructions reflect two weaknesses. Prices of 1900 signified nothing regarding real estate values of 1907; the value of land a mile and a half away was not a conclusive index of the value of the land immediately adjacent to the railroad. Though, of course, with a multiple of three to be applied — chosen as an approximation — it was hardly necessary to bother with minor difficulties. It should be enough that more than 55,000 sales, representing more than 1,300,000 acres, and "involving considerations approximating $100,000,000," were "taken into consideration."[3] Regardless of the validity of the premises, surely this represented painstaking research.

[1] In some of the smaller towns, Mr. Morgan used his own "judgment" (*ibid.*, page 2083); or compared the "values" given, with "values" of other towns of similar size (page 2129). It seems that in general he merely decreased the company estimates by 20 per cent, 50 per cent, etc. See testimony of Thomas Cooper (pages 3055–57). Mr. Cooper had some independent appraisals made by local "experts" in those towns (page 3060 and following).

[2] *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 12.

[3] *Ibid.*, page 13.

In making his appraisal of the terminal properties in the Twin Cities and Duluth, Mr. Morgan found his work in applying the sales and assessment method much simplified by certain investigations made by the State Tax Commission, and in St. Paul, by the Tax Committee of the City Council. These investigations aimed to determine the ratio of the selling price of land and the assessed valuation. The figure which Mr. Morgan actually used, however, while found in the report of the City Council Committee, first appeared in a newspaper article late in 1906. During the year 1905, 2654 transfers of St. Paul real estate had been made by deed; these were listed by assessment districts, the consideration in one column, the assessed valuation in another. For each district the ratio of assessment to the consideration was then calculated. This ranged from 50.25 per cent to 65.72 per cent. For the total 2654 transfers the ratio was approximately 60 per cent. This figure of 60 per cent, therefore, Mr. Morgan chose as a reliable index of the ratio of assessed value to "true value" — and made it the basis of estimating the cost of reproducing the terminal properties in St. Paul.[1] In Minneapolis the figure was 54.7 per cent.[2]

Even had he possessed assessments of railroad property made through the same judicial process on which the assessment ratio was based, Mr. Morgan would have been presuming in attempting to apply any such general average to that assessed valuation, in order to determine the "true value" of the land. The figure itself meant nothing; it was simply a general average which served to bulk a large number of varying ratios. In fact, as Mr. Morgan himself testified, the report of the Council Committee in St. Paul, presenting a table of actual transactions, showed a range of percentages from 33 to over 130.[3] So, while he did not

[1] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), pages 1982, 1998, and following.

[2] *Ibid.*, page 1818.

[3] *Ibid.*, page 1983.

claim that the ratio of 60 per cent, applied to a single tract would indicate a "true result," [1] nevertheless he "didn't undertake to take into account the individual inequalities." [2] When investigations were confined to a small area, "there might perhaps be only one or two sales in that locality, and they might not represent anything like the correct condition." The figure of 60 per cent therefore was chosen on the theory that it "would compensate one way and another" and that the appraisal would thus reach "fairly equal ground." [3]

In Minnesota, however, the railroads paid a gross earnings tax, and no "reliable" assessments of the railroad lands were at hand to which to apply the convenient ratio. For this reason it was "necessary" to measure the "cost of reproduction" from the "average value of contiguous and surrounding property." Accordingly, therefore, Mr. Morgan divided the terminal lands of each railroad into sections — the length of each section varying in accordance with his "best judgment." An "arbitrary" [4] area on either side of the center line in each of these sections was marked out, and investigation was made to determine the "market value" of land within each area.[5] The first step was to determine the assessed valuation of all real estate not owned by the railroad; assuming this amount to be 60 per cent of the "true value" of the land, the latter figure was determined. It was then a simple problem in division to determine the "value" per acre; and of multiplication to apply this "value" to the acreage in the rail-

[1] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 1982.

[2] *Ibid.*, page 1994.

[3] *Ibid.*, page 1993. See Complainant's Exhibit 65 — Morgan, which contains the data on which the 60 per cent was calculated.

[4] The size and shape of these sections depended upon Mr. Morgan's judgment as to the equality of the value of the non-railroad land adjacent to the railroad lands to be valued. He was forced to acknowledge that, changing the sections, different results would, of course, accrue. *Ibid.*, page 2345.

[5] *Ibid.*, page 1993.

road property. Increasing this figure by the approved multiple, Mr. Morgan arrived at the "cost of reproduction" of the railroad terminals.

The Master in this case, Mr. Otis, was not impressed that Mr. Morgan's appraisal was "entitled to much weight." [1] Did not the sales-assessment method ignore the fact that "real estate values are necessarily and largely a matter of opinion when applied to any particular tract or parcel of land"? [2] Mr. Otis therefore looked to the expert appraisals of the witnesses for the railroads, though professedly keeping in mind "that witnesses are necessarily and unconsciously influenced by the interests of those at whose instance they are called." [3] And his conclusions, passed on in perfunctory fashion by Judge Sanborn, came to the Supreme Court.

The Master's valuation, for he soon translated the estimated cost of reacquiring the land into "value," represented his own judgment as measured against that of the railroad witnesses. For, though not himself an expert, he presumed to find that the estimates of the railroad right of way agents were "too expansive" and fixed upon figures which were 75 per cent of their appraisals for land outside of the terminal cities. In essence this meant a multiple of two and a quarter, instead of three, that applied by the railroad right of way men. Mr. Otis presumed to make this change in the face of a protest from these experts that even three was too low, Mr. Hayden of the Great Northern having explained that "about three times" had been fixed

[1] Report of Chas. E. Otis, page 222. Expert witnesses for the railroads considered the assessment figures "wholly unreliable" and "entitled to no practical consideration." Minnesota Rate Cases, Record (G.N.), pages 367–68, 569, 580; (N.P.), page 3092.

Indeed Mr. Morgan was forced to acknowledge that their use was only admissible on the theory that applied to the whole it would "work out" what he thought "to be the truth," though "applied to the parts separately," — i.e., the sections into which he divided the line, and the area on either side, — he "would not say that." Record (N.P.), page 1996.

[2] *Ibid.*, page 223.

[3] *Ibid.*, page 222.

upon as "reasonably fair" by a conference of right of way men — in which "there were no two persons hardly that had the same ideal of that percentage." [1]

Mr. Hayden confessed that in making the "valuation" of right of way between stations, he used "principally his own judgment," to determine what it would cost the railroad; and arrived at a "market value" of the lands by dividing this figure by three.[2] In the villages he took the information available as to the value of building sites, divided the station ground "up into so many town lots," etc. His figure for "market value," however, he conceived to be the value "for purposes generally, not for railroad purposes," both in the villages and in the open country.[3] The basis of Mr. Cooper of the Northern Pacific, however, was something more. In his judgment the value of railroad land was always higher than that of adjacent land. But exactly how this additional amount was to be measured, except in the judgment of an expert, his testimony did not make clear. The figures to which he testified, therefore, represented his judgment, fortified by investigation of the value of adjacent tracts in the few cases where any doubt existed in his mind.

[1] Minnesota Rate Cases, Record (G.N.), pages 171–72. Mr. Cooper testified to the same effect, Record (N.P.), pages 215, 246.

[2] *Ibid.*, Record (G.N.), page 171.

[3] *Ibid.*, page 232. See Mr. Cooper's testimony quoted by Justice Hughes, Minnesota Rate Cases, 230 U.S. 352, 445.

CHAPTER III

PHYSICAL VALUATION — "COST OF REPRODUCTION" CAPITAL GOODS

THE inclusion of a generous allowance for "contingencies" has thus far been the nearest approach to a frank acknowledgment of the wide range of error necessarily attaching to the work of appraisal. Such allowance being made, totals have been presented purporting to show results accurate to the final cent. No doubt use of the "contingencies" allowance has represented simply the application of an expedient used in estimates of construction work to the task of determining cost of reproduction.[1] Indeed the justification of its use in the New Haven appraisal, was less that it was meant to cover omissions of items in the existing plant, than to include "many elements which would enter into the cost," though "not represented in the inventory." [2] The engineers who testified in the Minnesota

[1] Howard Elliott, Minnesota Rate Cases, Record (N.P.), page 1240; the Valuation Brief of 1915, pages 85–94; and Valuation Conference of May 27–29, 1915, *Proceedings*, pages 45–49.

[2] G. F. Swain, *New Haven Validation Report*, page 86. Among such items were included: "damages incidental to the work . . . interfering

Rate Cases indicated that to them the chief ground for inclusion of "contingencies" was the necessity to allow for "all those items which it was impossible to see in making an approximate estimate of work already done," as well as "any items that may be overlooked." [1] One of the railroad counsel even interjected the statement, "There always ought to be put at the foot of one of these statements 'e. and o.e.' — errors and omissions excepted." [2] But his brief later insisted that the figures, which he here so qualified, were "accurate and comprehensive." [3]

The allowance which the railroad engineers testified to as "customary" was ten per cent of the amounts spent for the permanent way and structures. Yet opinion was unanimous that this was low. Experience showed, they declared, that unforeseen costs ran "over rather than under ten per cent, and much greater than ten per cent." [4] The

with a farmer's water supply or cutting off access to his land; temporary structures which have been built in the progress of the work, but which are afterwards removed; . . . quicksand, . . . expenses incident to . . . reducing grades, involving lowering cuts while maintaining traffic, in which case, especially if the cut is in rock, the expense is enormously greater than it would be to construct the line in its final form in the first instance," etc. See testimony of A. H. Hogeland, Minnesota Rate Cases, Record (G.N.), pages 42–46; and the Valuation Brief of 1915, pages 94–102, "some concrete illustrations."

[1] W. L. Darling, Minnesota Rate Cases, Record (N.P.), page 549. See also his testimony at pages 12 and 69; that of J. B. Berry, *ibid.*, pages 739, 743; that of D. C. Morgan, *ibid.*, page 2043; that of J. F. Stevens, Record (G.N.), page 445. Mr. Darling testified (page 12): "We are very apt to leave out things and forget things that should be included, and for that reason I have allowed this item of contingencies which is generally allowed."

The Valuation Brief of 1915 (page 103) divides "contingencies" into two classes: (1) of construction; (2) of inventory; and (page 105) asserts, "It is more difficult to make an accurate estimate of the cost of reproduction new than the cost of actual construction about to be undertaken."

[2] Mr. Jared How, Minnesota Rate Cases, Record (N.P.), page 549.

[3] Brief of Messrs. Holden, How, Butler, and Mitchell for the Companies, page 311.

[4] J. B. Berry, Minnesota Rate Cases, Record (N.P.), pages 739–43; also testimony, J. F. Stevens, Record (G.N.), page 445; Howard Elliott, Record (N.P.), pages 1242–45. Ten per cent was used in the Michigan

engineer for the Minnesota Commission, however, insisted that a five per cent allowance was adequate, since the estimate was prepared "in the light of known conditions."[1] G. F. Swain, in the New Haven appraisal, though "personally" believing that the charge should be more than five per cent, used that figure.[2] In the Wisconsin and South Dakota appraisals five and a half per cent was used; in Nebraska, four per cent.[3] In Washington no allowance at all was made, the Chief Engineer of the State Commission alleging that "anybody that made up or included that item showed his ignorance." Or at least the Chief Engineer of the Northern Pacific, Mr. Darling, so testified, and then continued: "Well, the next day we discovered that the engineer had left out two items, one of a million and a quarter dollars and the other of a million for work done in Seattle and Tacoma. Now that took nearly half of the ten per cent; so you can see that that is one item that that ten per cent covers. And, right in my own estimate, I left out a million and a half dollars of equipment." It was here that Mr. How suggested his "errors and omissions excepted."[4]

The "contingencies" allowance like the land multiple is, then, an "average" figure. Generally it has been calculated upon the "cost of reproducing" the land as well as

appraisal. G. F. Swain (the *New Haven Validation Report*, page 86) said that "while this has by some been considered as excessive, those in charge of the work believe, in the light of their subsequent experience, that it has been fully justified." In the Michigan appraisal the ten per cent allowance was opposed as too large by the railroads, the "valuation" being for taxation purposes.

[1] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 1852 and following; see, however, the Valuation Brief of 1915, pages 104–06, citing testimony to the contrary by M. E. Cooley and H. E. Riggs in the Duluth, South Shore & Atlantic Passenger Rate Case of 1913.

[2] The *New Haven Validation Report*, page 87. The cost of "reproducing" land was not included.

[3] See *Senate Report on Valuation*, page 172.

[4] Minnesota Rate Cases, Record (N.P.), page 549. See *Second and Third Annual Reports*, Railroad Commission of Washington, page 43.

the other items of the permanent way,[1] and sometimes the cost of "engineering" has been included. The variation from the practice of determining the contingencies charge, by taking a percentage of the entire "cost of reproducing" the permanent way and structures, has not, however, been significant; and for the purpose of the present discussion, it is enough to point out that the factor of judgment and opinion has here had the fullest scope. No attempt has been made, therefore, to determine what percentage should be allowed for "contingencies" upon each set of items. Individual cases might show cost running fifty, even a hundred per cent above the estimate.[2] But though the percentage would not apply uniformly to all, the "total contingencies," it has been assumed, would equal the amount found by applying an "average" figure to the "total of the items . . . included." [3]

I

The work of the engineer in making the inventory of the plant necessarily involves dependence upon individual judgment, even upon the intelligent use of the imagination at every step. Before the task of measurement and computation can be taken up, the natural conditions met at the time of original construction must be conceived of as restored. This is necessary that the actual engineering task faced in the beginning may be "reproduced." To measure the acreage of "clearing and grubbing," the areas

[1] The Valuation Brief of 1915 (page 103) declares: "While all engineers agree that a substantial allowance must be made to cover contingencies, it may be said that the engineering valuation practice is not definitely settled as to the amount of the item, or the manner of adding the allowance."

[2] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 2044.

[3] J. B. Berry, *ibid.*, page 894. Here the figure was ten per cent. See testimony of J. F. Stevens, Record (G.N.), page 446. Mr. Stevens here spoke of the "percentage of contingency . . . an allowance . . . for the ignorance of the profession."

covered with trees and underbrush must be determined. The original contour of the land must be restored in order that the yardage of cut and fill may be measured. Swamps long since drained, or streams turned from their original beds, must present the difficulties surmounted by the constructing engineers. Given this setting for his work, the engineer's task is to determine what would be the cost of duplicating the road.[1] Assuming preliminary and location surveys made (their cost has universally been measured, like the "contingencies" charge, on a percentage basis), the work of inventory is begun.

In the "valuations" made by the States it has not been the practice of the engineer to take his instruments onto the right of way, and there to make detailed measurements. Field work of this nature has been resorted to only in the entire absence of office records in the engineering departments of the roads. Instead figures have been drawn from the records, and subjected to the more or less superficial

[1] Several of the questions discussed at the Valuation Conference of May 27–29, 1915, bear upon the topics discussed in this paragraph:

Question: "Shall an allowance be made for clearing and grubbing, and if so, shall it be allowed where the road runs through what is now tillage land, but what was at the time of construction, a forest?"

Railroads: "Yes."

State Commissioners: "No, if adjacent land is tillage land; yes, if adjacent land is now forest land and is so valued; no, if adjacent land has been cleared and grubbed and now valued as such; wherever allowance is made for clearing and grubbing, the value of the wood should be offset. If adjacent land is cleared and not grubbed, allowance should be made for grubbing only."

Question: "Are present geological and topographical conditions to be taken, or is inquiry to be made as to what these conditions were at the time of original construction?"

Railroads: "In considering the structural features of reproduction . . . conditions should be assumed to be as of the time of the original construction, except where they have subsequently been altered over areas entailing considerable additional construction difficulties which were met by the railroad from time to time as they arose."

Commissioners: "Present conditions should be taken," etc.

Proceedings, page 7 and following; see the Valuation Brief of 1915, pages 63–68.

check of "expert" inspection. In Michigan and Washington the inspection of records was made by State employees; in other cases, following the precedent set in Wisconsin, the railroads themselves furnished the preliminary figures. Were the engineering records to be accepted as correct, even perfunctory field work could be eliminated. The measurement would be a clerical, not an engineering, task. The very fact that records are so concededly inadequate as to compel resort to other authority demands, it would seem, the most careful and painstaking measurements.[1]

These State appraisal figures, though, like those presented by the railroads as "evidence" in rate cases, offering results set down as if accurate, have never been determined by resurvey. Mr. Morgan, the Minnesota Chief Engineer, testified that the essential distinction between his work and that of Mr. Taylor in Wisconsin, and of Mr. Cooley in Michigan, lay in the "thoroughness of the work."[2] Description of his plan—in essentials followed in

[1] J. F. Stevens, who, at the time of testifying in the Minnesota Rate Cases, was Vice-President of the New Haven (he had been Chief Engineer of the Great Northern, of the Rock Island, and of the Panama Canal), declared that the Great Northern had "probably the best set of engineering records in the United States, or among the best." Record (G.N.), page 426. As regards grading quantities these records showed 73 per cent of the yardage; and of the remaining 27 per cent of the total as estimated, 23 per cent was estimates from profiles; and 4 per cent was determined from the "knowledge of the lines" possessed by the Chief Engineer, Mr. Hogeland. See his testimony, *ibid.*, page 15. If these are records, "superior to any in the United States," it would seem that entire dependence on records would be quite out of the question. The incomplete character of the railroad records was generally certified to at the Valuation Conferences between the Engineers representing the Commission and those representing the railroads, held September 4–5, and October 14–15, 1913.

[2] Minnesota Rate Cases, Record (N.P.), page 1975. Mr. Morgan described some work which he did as an employee of the C. St.P.M. & O.: "We divided the line into some seventeen sections in the State of Wisconsin, and the authorities, after receiving the report, shook up the numbers of the sections in a hat and picked out a number, and that was the number of the section which they went out to examine; and if they found the conditions right on that section, they assumed that it was right on the entire system."

South Dakota and Nebraska — indicates that "thorough" was still a relative term in Mr. Morgan's mind. The railroads furnished figures of quantities based upon their records, and these were checked by Mr. Morgan and several assistants. This official inspection was made from a train "moved at a low rate of speed, so that observation could be had of the character and standards of construction and maintenance." To be sure, "stops were made every mile in places, but usually every two miles, and sometimes every five miles. . . . A day's work of ten hours enabled an average inspection of about one hundred miles." [1] Strange as it may seem, even this almost casual inspection did show some gross inaccuracies in the railroad figures.[2]

Nor would covering twelve miles a day on foot, or twenty-five miles on a hand car, "stopping for occasional measurements," promise results necessarily conclusive.[3] Perhaps a greater degree of accuracy is attained than where entire dependence is placed upon the "judgment," "knowledge," "experience" of the chief engineer of a large railroad. But it would be difficult to generalize. When Mr. Darling, of the Northern Pacific, was directed to determine the "cost of reproduction" of that road for use in the Spokane Case, he increased the quantities appearing on the records by twenty per cent to take account of changed construction standards. The figure used as a basis did not

[1] *Supplement, Report,* Minnesota Railroad & Warehouse Commission, 1908, page 23. Inspection from a slow-moving train had been used by Mr. Morgan's father, R. P. Morgan, in the appraisal for the Pacific Railway Commission. See Senate Executive Document 51, 50th Congress, 1st Session, page 4469. See testimony of J. J. Hill, Minnesota Rate Cases, Record (G.N.), pages 1251–52; of A. H. Hogeland, *ibid.*, page 1647; and the Brief for the Companies, pages 306–07.

[2] See testimony of D. C. Morgan, Minnesota Rate Cases, Record (G.N.), pages 1389–90; of W. L. Darling, Record (N.P.), page 91; and Mr. Morgan's letter addressed to President Elliott, Defendant's Exhibit B. Mr. Darling testified that the report submitted the State had not been "checked or edited."

[3] See Report of H. P. Gillette, Chief Engineer, to the Washington Railroad Commission, *Second and Third Annual Reports,* page 47.

represent a resurvey, but was based on profiles, etc.[1] And the arbitrary twenty per cent was chosen in "probably an hour." It was "a mere matter of calculation," "simply a matter of judgment," [2] "just as accurate as anybody can possibly get it with the very best of judgment." [3] In the Spokane Case, too, the Chief Engineer of the Great Northern testified that the records of the Company showed quantities in the case of 82 per cent of the entire system, and that a "very close estimate could be made of the remaining 18 per cent."[4] Commissioner Prouty could therefore speak of the Northern Pacific "valuation" as "by no means a guess," [5] though that of the Great Northern was "more satisfactory." He was "impressed" that this estimate had been prepared in good faith and with great care.[6] It would here seem difficult to draw the line between "guessing" and making an expert judgment.[7]

That such inconclusive figures — inconclusive from the viewpoint of statistical accuracy — should have passed through the hands of the Interstate Commerce Commission without severe condemnation would seem almost incredible. But how much more worth while a check made from the platform of a slowly moving train would have been must necessarily be difficult to say. Mr. Darling insisted that the only way a more accurate measurement

[1] The figures used as a base were simply estimates made at the time of the reorganization of 1898. Spokane *v.* N.P. Ry. Co., 15 I.C.C. 376, 395. See Mr. Darling's testimony, Minnesota Rate Cases, Record (N.P.), pages 80–81.

[2] Minnesota Rate Cases, Record (N.P.), page 82.

[3] *Ibid.*, page 81; also, pages 33 and 48.

[4] Spokane *v.* N.P. Ry. Co. 15 I.C.C. 376, 402. The 18 per cent refers to mileage. How large a proportion of this lay in a mountain country is a significant detail, here untouched.

[5] *Ibid.*, page 396. The Valuation Brief of 1915 (page 339) quotes this assertion with apparent satisfaction.

[6] Spokane *v.* N.P. Ry. Co., 15 I.C.C. 376, 402.

[7] Mr. Melcher, of the Rock Island, "guessed in his judgment" — his guess being "analogous to judgment" — that it would cost $404,000,000 to reproduce that road in 1910. Evidence, 1910 Advances, pages 265–67.

could be secured than that accorded by his twenty per cent allowance was by the slow process of measurement.[1] Perhaps he was right. It is for the engineering profession to give the verdict.

Yet it cannot be said that engineers have appeared willing to accept resurvey figures as in any sense insuring accuracy. Mr. Gillette, the engineer in charge of the Washington appraisal, expressed himself in the following vigorous language: "An attempt to estimate by field survey should be the last resort, not only on account of the greater cost of field work, but because of its greater inaccuracy, and finally — but not to be ignored — because, in a legal dispute as to the estimated cost, field surveys and estimates made by different engineers are likely to differ widely . . . a field survey should be used only as a last resort."[2] Asked in the Minnesota Rate Cases whether construction did not sometimes so destroy the original conditions that it was now impossible to estimate what work had been done, Mr. Morgan answered in the affirmative, "unquestionably."[3] Without records, a larger percentage for contingencies would be necessary. The engineers of the railroads and Mr. J. J. Hill testified to the same conclusions. Equally unanimous were they as to the inadequacy of estimates made from profiles.[4] A profile "simply shows a vertical section through the roadbed, the ground line and the grade line both showing, so as to determine where the

[1] Minnesota Rate Cases, Record (N.P.), page 81.

[2] *Second and Third Annual Reports*, Railroad Commission of Washington, page 47.

The Valuation Brief of 1915 insists that "original records, when corroborated, furnish better evidence than present measurements." (Discussed at length, pages 54–61.)

[3] Minnesota Rate Cases, Record (N.P.), page 2045. See the Valuation Brief of 1915, pages 105–08.

[4] W. L. Darling, Minnesota Rate Cases, Record (N.P.), page 49; J. F. Stevens, Record (G.N.), page 429; J. J. Hill, *ibid.*, page 1252. Mr. Stevens testified, Record (G.N.), page 429, "as a rule you underestimate always with a profile estimate." Mr. Hogeland, *ibid.*, page 1650, showed that his figures based on profiles had been increased ten per cent.

cuttings and fills exist." But it does not show "the width of roadbed" or "the nature of the ground." Where the records are incomplete, such information "generally comes from personal knowledge." [1]

If the problem be one of measurement alone, therefore, it can hardly be said that the determination of grading quantities is one permitting more than the broadest approximation. The burden of restoring the difficulties met at the time of construction necessarily involves this limitation. Even with the physical contour restored, it would still be necessary to estimate the amount of earth "lost" in building an embankment across a swamp; the cost of extra labor occasioned by the falling of tunnel walls — unless, to be sure, these are to be allowed for in the "contingencies" charge. Even with accurate figures of yardage the responsibility would remain of determining how the work would be handled, whether by steam shovel or by team; of calculating the amount of overhaul, of "waste," of "borrow." [2]

And there would be the final task of "classifying" the materials, as earth, loose rock, solid rock, etc. Even in construction work this is recognized as "estimating." What must it be when the attempt is to determine the "cost of

[1] A. H. Hogeland, Minnesota Rate Cases, Record (G.N.), pages 1644–45. See Mr. Darling's testimony: "Those things you have got to have judgment for, you have got to know the conditions under which the line was built." Record (N.P.), page 50.

[2] In the New Haven Appraisal, conducted under the direction of G. F. Swain (where J. F. Stevens' appraisal made for the New Haven was checked), "the inspection of the lines owned occupied a period of twelve days with a special train." *New Haven Validation Report*, page 78. The work was largely one of checking profiles, and changes were effected by calculating that different methods of handling the construction work would be used from those assumed by Mr. Stevens. The Swain report, eliminating overhaul and train-haul entirely, increased the amount of "borrow," etc. That significant changes in result could be effected through this process is indicative of a further dependence upon "judgment." See the *New Haven Validation Report*, page 76, and also the testimony of D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 2113, on steam-shovel work, etc.

reproducing" cuts and fills where the work was done ten, twenty, fifty years ago[1] — when the sides of cuts are overgrown, when rock has slid from place? Can inspection expose quicksand, which to-day appears no different from "straight earth"? Is there wonder that Mr. Darling testified: "You can't get at the classification" (accurately)?

Equal elements of uncertainty attach upon much the same grounds to the estimates of the amount of rock in protection work, tunnel linings, bridge piers, etc.; or, if construction be of later date, the quality and quantity of concrete. In the case of pile bridges, the length of piling and of bridge timbers must be estimated; or, where temporary trestles have been built in order to cross a low stretch of ground where dirt was later hauled in, the amount so used must be approximated. And there are the small culverts and drain pipes.

But assume the measurement of the roadbed and bridges completed. The amount of track laying and "surfacing" (labor costs, in large degree, usually estimated by the mile) is yet to be determined; the number and weight of rails; the number and quality of ties; the track fastenings; the ballast. Even in the case of ties, rails, frogs, track fastenings, where the task might seem to be one of mere counting, the problems of classification are complicated.[2] But to

[1] D. C. Morgan, Minnesota Rate Cases, Record (G.N.), pages 1384–95. See testimony of W. L. Darling, Record (N.P.), page 50.

Yet he made a classification, relying upon his "judgment" and "general knowledge of the situation." *Ibid.*, page 86. As good a case as any of classification based on casual inspection is shown in the *New Haven Validation Report*, pages 76 and 78. Here the volume of solid rock was increased over a million yards, — from 7,277,677 to 8,380,408 cubic yards, — on the basis of inspection from a train, etc. Yet the figures were, as usual, set down as though accurate. See also the Valuation Brief of 1915, pages 48, 49, 98.

[2] For example, ties must be classified according to the kind of wood, the grade in each case (the standards of the American Railway Engineers, for example, specify the measurement of No. 1, No. 2, culls, etc.); whether treated or untreated, and if the former, by what process; while really

indicate these in detail would encroach upon the engineering aspects of the subject. It is enough to notice that more is needed than a mere count; that "judgment" is essential in establishing the specifications for various grades, whatever the "unit" considered, and in seeing that the inventory represents an intelligent grouping of these items. Some of the most difficult problems are met in an estimate of the amount of grading; but the element of uncertainty extends beyond this.[1] The same complications appear, too, in appraisal of the permanent structures. These include such different buildings as freight and passenger stations, office buildings, signal towers, engine houses, shops, power plants, water tanks, coal stations, etc. Here the task of inventory demands an estimate of materials and of the amount of labor necessary for the work of construction in each individual case. Unless, to be sure, the practice of Mr. Darling in his "valuation" for the Spokane Case be adopted of idealizing an "average" structure, and permitting this task of inventory to degenerate to one of mere counting.[2]

accurate classification would include also whether the ties were hewn, or sawed, and whether made from a whole tree-trunk (pole ties); from a half, or a quarter, etc. Rails do not present so complicated a group of detail factors, the standard for each material (iron, steel, titanium, etc.) being in terms of pounds per lineal yard; but frogs, track fastenings, spikes, tie plates, switches are of numerous varieties (some patented), etc.

[1] See testimony of W. L. Darling, Minnesota Rate Cases, Record (N.P.), pages 3207–47, a comparison of his figures for the Minnesota lines with those used by Mr. Morgan.

[2] "I had to get an average water station" (*ibid.*, page 41). For roundhouses, he made a count of "stalls" (page 42). On shop buildings, however, the unit of count was in terms of square feet, not of board measure, or the volume of brick. It may be said, of course, that on most roads, if not all, there are standard station house plans which are used over the line; definite specifications for water stations, and section houses, etc. But a considerable number of the structures (one could not venture to estimate how many) stand in a class alone. Engine terminals have been expanded to meet growing needs; additions have been built to office buildings; a station has been designed to meet peculiar conditions. To determine upon the quantities of materials contained in these structures (in the absence of the detailed plans) would call for eyes of supernatural power.

Turn now to the equipment items: locomotives, passenger and freight cars, work trains. It is here that the railroad records are most complete, and the work is largely one of checking. Even the fact that there are a large number of different locomotive types used side by side (or classes of cars) simply means a more detailed grouping.

This brief sketch of the wide scope of the appraisal serves to indicate only the broadest outlines of a problem requiring technical skill of the highest order. Many of the details lie peculiarly in the domain of the civil engineer,[1] many in that of the mechanical engineer,[2] not a few in that of the electrical engineer.[3] Necessarily any inventory based entirely upon expert opinion — "judgment" — is subject to a significant range of error even in the work of measurement and count. When the further requirement of classification is seen as a prerequisite to any intelligent attempt at inventory, the degree of this error promises to be much greater. In the case of the permanent way dependence upon expert knowledge appears most strikingly, since it is here that the great work of "imagining" (there is no other word) the conditions met at the time of construction appears. But that results more conclusive are secured by measurements of all structures (including bridges) is doubtful. And though, in the case of ties, rails (and every item of the track superstructure except ballast), the imagination is relieved of its burden, a premium is placed upon accurate judgment and painstaking measurement in the choosing and grouping of classifications.[4] But as between fixing upon the amount of seventy-pound or eighty-

[1] The permanent way and structures, etc. See, for example, "Instructions for Building Field Parties," for the "Field Work of the Roadway and Track Department," and for the "Bridge Field Parties," issued by the Division of Valuation, I.C.C.

[2] Rolling Stock, shop equipment, etc.

[3] Power plants, signal apparatus, etc.

[4] See the "Instructions for the Field Work of the Roadway and Track Department," Division of Valuation, I.C.C.

pound rail in a stretch of track, and determining what portion of a cut of fifty thousand cubic yards should be paid for as earth, as loose rock, or as solid rock, there is no question of the relative simplicity of the former. In either case, — in any case, — everything must be placed entirely in the hands of experts, with the hope that engineering practice will give the best it has.

That such has not been given in the past, there can hardly be doubt. The engineering work of the State appraisals, to the layman at least, would seem almost perfunctory when the extent of the issues involved is realized. Whether the work of resurvey, etc., can promise results necessarily more significant than those secured by the States, or those presented by railroad engineers as based upon their experience or judgment, is an issue which must be left with the engineering profession to decide. If not, we are at the point where in frankness we should say of the results: they are an engineering guess; nothing else can be hoped for. The Wisconsin Commission, it would seem, bowed to the inevitable when it admitted that "in appraisals . . . there are many points upon which the facts are not clear, and which of necessity are matters of judgment," where the appraisers are "often justified in giving their clients the benefit of the doubts." [1] How such a policy could be expected to work out were one set of witnesses only "moderately expert" while another set possessed qualifications which were "indisputable and of the highest order," must remain a matter of speculation.[2] It is enough for the purpose of the present discussion to indicate that no appraisal results can profess to represent accuracy. And this holds true entirely aside from any consideration of the unit prices which are applied to the "quantities" in order to translate these into terms of dollars and cents.

[1] Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 87.

[2] Brief for the Company, page 57; Knoxville *v.* Knoxville Water Co., 212 U.S. 1.

II

It must be emphasized that, in a study of "physical valuation" from the economic point of view, there cannot be a detailed consideration of the "unit" prices for each item of the inventory. It is principle, and not detail, that is significant. The work of defining the specifications for the "units of cost" demands expert engineering ability.[1] So also does that of fitting prices to these specifications as chosen. In fact, the unit prices necessarily vary with a change in specifications covering the "units of cost." In the hands of a second engineer, though the same piece of plant be under view, a different set of specifications (and the different set of unit prices thereby made inevitable) might be used. It is even conceivable that both men should get the same final total, though using a different basis of calculation — however improbable such a result would appear.[2] At all events, the weakness attaching to expert opinion (or call it "knowledge," "judgment," "intuition") is always present, whether the degree of error be conceived as large or small.

For unit prices depend entirely upon the personal judgment of the expert who chooses them. No matter how detailed an examination of cost data may be made, the fact remains that, since the unit prices and classification stand-

[1] "Units of cost" are the physical units for which the unit "prices" or unit "costs" are fixed. Testimony of D. C. Morgan, Minnesota Rate Cases, Record (N.P.), page 1780.

[2] For example, assume a cut containing 50,000 cubic yards. One engineer, using a "rock" price of $1 per yard, a "loose rock" price of 50 cents, and an "earth price" of 25 cents, "classifies" the contents as 50 per cent "solid rock"; 30 per cent "loose rock"; 20 per cent "earth." This gives him a total of $35,000 for the cost of excavation. Another engineer, using only "rock" prices and "earth" prices (under "earth" grouping everything except "solid rock"), classifying the quantities 50–50 would get the same total cost by using an "earth" price of 40 cents. For further illustrations, see testimony of W. L. Darling, Minnesota Rate Cases, Record (N.P.), page 3209; the *New Haven Validation Report*, page 78; and the Valuation Brief of 1915, page 129.

ards (as well as the methods of work) must be correlated, every price ultimately depends upon expert opinion. The question is not one of relatively accurate or inaccurate results, as is the case with measurements, but one of the entire adequacy of the figures finally presented. Though an accurate inventory of physical quantities were secured, a different choice of unit prices would cause variation in the "valuation" figure.[1] Three distinct bases for "cost of reproduction" have been proposed: (1) prices presumably obtaining through a future construction period; (2) "present prices"; (3) average prices over a period of years.

In view of the large variety of "units" in the inventory of a railroad, and the large number of standards and classifications under each, it is clear that an extremely difficult technical problem is here presented. One can be very skeptical of the validity of the assertion (though made by an "expert") that "the determination of the proper prices . . . is not a very complicated matter," since "an average figure based on proper experience and judgment may prove as satisfactory as a figure laboriously worked out from a mass of varying data." Though perhaps there may always be "opportunity for abbreviating the work by due consideration of this matter by a competent expert,"[2] the difficulty in the past has been to get experts able to "average" qualities, prices, and judgment, with any degree of unanimity. "Proper experience," "due consideration," "competency," are noncommittal phrases. The situation should be frankly faced. Unit prices used in making "cost of reproduction" estimates have been based upon personal opinion. The error always attaching to work of such character attaches to any unit prices adopted upon that

[1] "Two engineers may undertake the appraisal of the same property, use methods which seem perfectly fair to each, and arrive at results differing as much as 20 per cent or 30 per cent." W. D. Taylor, Chief Engineer of the Wisconsin Appraisal, *Transactions*, Am. Soc., C.E., volume 52, page 354.

[2] Henry Floy, *Valuation of Public Utility Properties*, pages 62–63.

basis. The limitation is one inherent in the problem. And it is not one to be glossed over by resort to generality.

"Cost of reproduction" presuming to prophesy the probable course of *future prices* has been the exceptional basis. Yet the "valuation" which Commissioner Prouty, accepting a volume of detail as evidence of accurate and careful work, called "by no means a guess," — that presented by the Northern Pacific in the Spokane Case, — was predicated upon such attempt at prophecy. We have already seen that the "quantities" came from records confessedly incomplete, an arbitrary allowance of twenty per cent having been added in the case of grading (the choice of this figure, rather than ten per cent or thirty, being dependent entirely on the judgment of Mr. Darling, the Chief Engineer). The unit costs, used in connection with these grading figures, were such as Mr. Darling thought would be paid through a period of ten years supposing "a certain amount of plant available for the work." The prices were "about" those that would be paid the contractors, plus allowance for the work which the company would itself do after "accepting" the grading done by the contractors.[1] At the time of his testimony in the Minnesota Rate Cases, these figures were over two years old, and the interim had seen the panic of 1907. There was on this account, in July of 1908, "a temporary depression in prices below what they were in 1906 and 1907." However, "if the Northern Pacific were to start to build its something over 8000 miles of track . . . within ten years," Mr. Darling felt that "it would have an influence in stiffening prices back to their highest level." [2] It would not be worth while, however, to

[1] Minnesota Rate Cases, Record (N.P.), pages 10–11.

[2] Examination by Mr. How for the company, *ibid.*, page 584. Mr. Darling also explained the importance of supposing "a certain amount" of plant available: "Why the price of grading, the cost to us of work, depends entirely upon the available plant of contractors, and on what we have ourselves. When we have a lot of idle plant, more than enough to keep the work going, the price would not go up. . . . When labor is plen-

continue through the inventory, item by item. For present purposes, it is the point of view that is significant, the underlying hypothesis. Though the prices used were in many instances "very close" to those being paid in June, 1908, all were chosen on the basis that the work could be done in ten years.[1] The prices were "future" prices, not "present" prices, even in 1906 when the estimate was first made.

In his appraisal of the Minnesota lines, especially prepared for the Minnesota Rate Cases, Mr. Darling abandoned all attempt at prophecy, however, and based his figures upon "*present prices.*" [2] By express provision of the statute directing the making of the Nebraska valuation, the same basis was prescribed for the work there; the bill even providing for periodic "revaluations." [3] The Washington Commission prided itself that, having a full inventory of unit quantities, it could at any time secure another cost of reproduction estimate by applying "present prices." [4] And the South Dakota Commission, using in-

tiful, the cost of labor comes down." See page 117, and page 2059 (Mr. Morgan's denial).

The Valuation Brief of 1915 (page 139) says: "It is the common experience of all railroad companies that prices of labor and materials tend to rise whenever a construction enterprise of any considerable size is undertaken, and it therefore follows that prices existing when there is stagnation in railroad building should be given little if any weight as a guide to normal unit prices. It also follows that the announcement of an undertaking, comparable to the reproduction of any of the railroads of the United States, would at once tend to increase the prices of labor and materials, and the shorter the time allotted to the reproduction programme, the more intense would be the increase in the prices of such labor and materials. Prices of labor and materials at a time when there is little or no demand should, therefore, not be taken; and on the other hand, there should not be assumed a demand in excess of a supply reasonably available within the time required for a proper reproduction programme."

[1] Minnesota Rate Cases, Record (N.P.), page 33; see page 37 to the same effect.

[2] See Complainant's Exhibit 3, N.P. Case.

[3] *Commission Regulation* (National Civic Federation), pages 196–97.

[4] *Second and Third Annual Reports*, Railroad Commission of Washington, page 129. To the same effect, see Report of W. D. Taylor, Chief

terchangeably the phrases, "cost of reproduction" and "value," declared that, since cost of reproduction is "changing constantly . . . in order to be of any practical use, the physical valuation should be continued from year to year, so that in each year the valuation of the property will reflect the actual conditions during that year." [1]

Average prices over a period of years immediately preceding the date of the appraisal, though resorted to in part by M. E. Cooley in the Michigan valuation,[2] have received their widest use in the hands of the Wisconsin engineers.[3] In Minnesota Mr. Morgan consoled the Commission over the refusal of the roads to accept a five-year average, with the statement that a review of prices for the five years prior to June 30, 1907, the effective date of his appraisal, showed that in most respects the prices used were as near the five-year average as was "practicable" for the purpose of his inquiry.[4] The figures used in the appraisal of the New Haven System made under Mr. Swain's direction were based "upon the average ruling price for the various elements during the past few years" — hardly a very definite explanation.[5]

Engineer, Wisconsin, Bulletin 21, U.S. Census, *Commercial Valuation of Railway Operating Property*, page 87.

[1] South Dakota R.R. Appraisal, Report of C. C. Witt, Engineer, page 4; introductory comment by the Board.

[2] Discussed at length by H. E. Riggs, *Transactions*, Am. Soc., C.E., volume 72, page 13.

[3] The expedient of using five-year averages, first adopted by W. D. Taylor for his Railroad Appraisal of 1901, has been used in the subsequent public utility appraisals. See, especially, State Journal Publishing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501; and Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1.

[4] *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 7. See his testimony, Minnesota Rate Cases, Record (N.P.), page 1780.

[5] The *New Haven Validation Report*, page 88. "In some cases they were based upon the figures given by the chief engineer of the railroad company as to the actual prices which the company has been paying."

In order to avoid using figures affected by conditions of the moment the Wisconsin Commission has resorted to "average prices." The expressed desire has been to secure "a reasonable middle ground, neither high nor low," guarding "against extreme fluctuations." [1] Applying such an average cost, to an "average" or typical unit (as, for example, attempting to get a unit price for "earth" over the whole State) has piled approximation on approximation. An average is never more than a rough measurement, depending for its value entirely upon the care with which the data are chosen, and the accuracy with which they are handled. That an "average" price should be worth more than a price fixed only by "expert opinion" is very doubtful. On the grounds of statistical significance, a large percentage of error must be reckoned with in either case. And why, if five years is a desirable period over which to consider data, should not the period be extended to six, or ten, or even twenty years? There is always

[1] State Journal Publishing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 509.

The following, from the Wisconsin Commission's opinion in Hill *v.* Antigo Water Co., indicates the philosophy behind the "average" figures of the Wisconsin appraisals:

"Current prices are the most easily obtained, and they offer the fewest complications, but the results obtained under them may not always be fair to all concerned. Average prices are more difficult to secure, and they also imply that in selecting them, there must be choice of periods or quotations, upon which choice many disputes may hang. To secure prices, however, that *approximately represent normal conditions* is by no means impossible, and it is likely that such prices would, in most cases, be the fairest of all. . . .

"Rates based upon valuations that rest on current prices would necessarily have to be changed with all changes in these prices. This would manifestly be impracticable, and perhaps unjust both to the plant and its customers. Prices of practically every element are moving up and down so often that under no known method could the rates be changed and applied with equal frequency . . . desired stability in the valuation can usually be obtained by carefully computing it upon the average prices for a term of years. . . . Just how long a period should be chosen cannot be stated offhand. But a little investigation will readily disclose the *usual or normal price* in each case," etc. 3 W.R.C.R. 623, 638–40.

danger, when averages are used and a large volume of material handled, that tabulations, mechanically ingenious, will be accepted as scientifically valid. An "average" cost is an especially dangerous tool. In a period of rising or falling prices and wages, the length of the period used must of necessity materially affect the results secured. For the purpose of the Wisconsin Commission a five-year "average" price may be satisfactory. But the appraisal figures secured have been only approximations, neither more nor less significant than if secured on a "present" or "future" price basis.

The railroads have urged, in the conferences held to establish bases for determining unit prices for the Federal Valuation, that averages should be "weighted" with judgment. Two sets of factors should be considered:

> "Actual prices (weighted average) and conditions affecting labor and material markets during a period of ten years preceding June 30, 1914, with appropriate consideration to the existence or non-existence of actual railroad construction in that period." [1]

The programme would seem a combination of the "average" basis and the "future" basis.

Indeed, the further assumption has been that the Interstate Commerce Commission faces a problem "like that of a contractor":

> "The contractor who is about to bid for the construction of any of these railroads . . . would consider averages . . . trends . . . present prices . . . conditions of the labor and material markets, and many other factors; having taken all

[1] The Valuation Brief of 1915, page 141: "The prices to be used in the valuation should be arrived at by a consideration of prevailing prices, price tendencies and conditions and material markets during a reasonable period of time next preceding, and at the date as of which the valuation is to be made, due consideration being given the existence or non-existence of active railroad construction during that period" (page 134).

into consideration he would arrive at a conclusion infinitely more accurate than any mere automatic or mechanical determination. The average which he would consider, and which we urge should be considered, is the 'weighted average.' . . . If the contractor finds that the trend is level, he comes out pretty safely in taking prices which will approximate . . . the weighted average. If he finds the trend is definitely upward, he will not care so much about an average of prices made years ago, below the lowest of the present, but will consider almost exclusively present prices, disregarding the unusual and the bulges caused by periods of great boom, and the drops caused by temporary flurries and panics. So, if he finds the trend is definitely downward, he will not pay much attention to a high average, or high past prices when all the recent prices have been low." [1]

"The particular prices to be employed for a particular carrier will vary from average prices as conditions require. After all phases and conditions surrounding the work have been digested, a decision must be reached by the exercise of sound judgment, and frank discussions between representatives of the Government and the carriers." [2]

Especially intricate would be the task of fixing a unit price for a commodity no longer on the market in significant quantities. Departure from the use of ten-year averages, and the use of "price tendencies for an appropriate period," has here been suggested by the railroads.[3] An example will readily serve to illustrate the difficulty. Oak ties, comprising over an eighth of the ties in the Minnesota lines of the Great Northern, had originally been cut along the right of way by the farmers. But in 1909, the supply of oak ties in that State was practically exhausted; and, if oak ties were to be "reproduced," it would be necessary to draw on Southern forests. Accordingly the Great Northern Engineer, A. H. Hogeland, used the unit price of 85 cents a tie, a price which J. F.

[1] Valuation Conference of September 30, 1915, statement of Sanford Robinson, of counsel for the railroads, *Proceedings*, pages 31–33.

[2] The Valuation Brief of 1915, page 128. [3] *Ibid.*, page 162.

Stevens, who "had a pretty intimate knowledge of the oak tie situation throughout Missouri and Arkansas and Indian Territory," agreed would be the cost of oak ties bought in St. Louis, and delivered in Minnesota. As a matter of fact no such price was being paid; and, as might be expected, oak ties were not being used by the Great Northern. Any advantages which such ties might possess, and these advantages were set forth in detail by Mr. Stevens, were compensated by the lower prices for cedar and other ties.[1] Instead of determining a "reasonable" unit price for oak ties on the Great Northern, the Master avoided this difficulty by applying the unit prices testified to by Mr. Darling of the Northern Pacific. But he did not take Mr. Darling's price for oak ties of 75 cents and transfer it to the case of the Great Northern. Instead he took the average "cost of reproducing" ties, a weighted average of 67.2 cents per tie, and applied it to the number of ties estimated to be in the Great Northern line, with an entirely different distribution as between oak, cedar, tamarack, etc. The price of 55.5 cents which had been applied in the State appraisal to all ties, and to all roads alike, was rejected on two grounds: "the rapidly increasing price of ties," and the failure to allow for inspection and handling.[2] This illustration of the determination of "unit costs" for ties thus serves to emphasize three difficulties involved in choosing "unit costs": (1) lack of data for certain items of the inventory; (2) the tempta-

[1] A. H. Hogeland, Minnesota Rate Cases, Record (G.N.), pages 101–02; J. F. Stevens, *ibid.*, pages 431–36; D. C. Morgan, Record (N.P.), page 1930. See also G. F. Swain, the *New Haven Validation Report*, page 80: "Additional ties would . . . be procured from other parts of the country, at higher prices [than those paid for ties cut along the right of way], so this item might easily be increased by a million dollars or more."

[2] Report of Chas. E. Otis, page 226. The Brief for the Companies, page 305, complained that this expedient unduly reduced the present cost of Great Northern ties as established by its current expenditures.

tion to secure an "average" or "bulk" figure; (3) the dependence upon experts.[1]

These difficulties are closely related. The lack of data necessarily means reliance upon experts; and the fact that experts do not agree serves to emphasize the dependence upon "judgment"—though if the experts did agree it would not furnish any conclusive proof one way or the other. Then the use of an idealized unit of cost, an "average" tie, an "average" mile of track, an "average" yard of earth, an "average" water station, etc., indicates resort to a short cut which at once shuts off the possibility of securing more than the most uncertain approximation.[2] The Master's use of such an "average" for ties was simply adoption of an expedient used by all the engineers testifying before him. In South Dakota,

[1] Operating in the same general territory, it might be expected that the Northern Pacific and Great Northern figures of cost would be very close together. While undoubtedly standards might not be the same in both cases, yet it might well be expected that for rails, ties, grading, lumber, labor, etc., the unit prices would be approximately the same. As a matter of fact, the prices varied considerably, now the N.P. price being the greater, now the G.N. Sometimes the Master applied the G.N. price to the N.P. quantities and sometimes, as in the case of ties, an average N.P. price to G.N. quantities. For example, the G.N. ballast price of 62 cents was used for the N.P. which had claimed a price of 66 cents, though an aggregate of 1,548,332 cubic yards of ballasting had been done in the years 1906, 1907, and 1908 at an average cost of 81.69 cents per cubic yard. See Minnesota Rate Cases, Record (N.P.), page 3221, and Brief for the Companies, page 286 and following.

[2] The appraisal of the Northern Pacific made by J. B. Berry, Chief Engineer of the Rock Island, and presented to the Interstate Commerce Commission, was based upon a series of "unit miles," designated A, B, C, D, etc. As Mr. Berry's train passed over a mile of track, he "simply looked" from a post of vantage in his private car, and made note as to whether it belonged in A, B, C, or whether he should not take one half of each of the costs for grade A and B — i.e., AB, etc. His car was attached to regular trains, he completed his examination of about one half of the system in approximately three weeks, covering about 250 miles per day, and classified some of the unimportant branches without this inspection. But his figure was duly presented to the Commission as "expert" testimony. He estimated the cost of reproducing the Northern Pacific as $395,376,749.40(!). Minnesota Rate Cases, Record (N.P.), page 718 and following; and Complainant's Exhibit 25.

the Commission's Chief Engineer even found such an "average" for all land in the State.[1] Mr. Taylor, in Wisconsin, was "anxious" to secure the agreement of the various engineers that 20 cents a cubic yard for earthwork excavation without overhaul was a reasonable price all over the State.[2] Mr. Hogeland, of the Great Northern, used a classification of grading quantities that included seven distinct categories; Mr. Darling "bunched" all grades except solid rock, thus simplifying his arithmetical task.[3] Similarly, in the Spokane Case "valuation," he had fixed upon a price for "an average water station," for roundhouse stalls, for fencing (using a figure of $150 per mile, though the price, due to different specifications, varied from $130 to $300 per mile). "Clearing" he put in at $80 per acre, though the prices varied "all the way from $35 to $250 an acre." Even the tunnels were grouped, and "average costs" used.[4] Just as interesting was the Minnesota appraisal of locomotives, by the pound. Mr. Morgan had "never bought any locomotives," but he was able to say that none of the locomotive company representatives with whom he talked seemed 'to be embarrassed in the slightest when he talked to them of the cost of locomotives by the pound. They had in their

[1] "The average value of the State worked out $32 an acre approximately. Taking the acreage of 16,138.6, multiplying that by $32, and by the multiple 2½, gives a value of $1,292,483." Testimony of C. C. Witt, quoted, C. & N.W. Ry. *v.* Smith, 210 Fed. 632, 639.

[2] Report of W. D. Taylor, Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 86.

[3] Mr. Hogeland listed earthwork under four headings: 18 cents a cubic yard; 23 cents; 31 cents; 39 cents; in addition he had the classifications: hard pan, 45 cents; loose rock, 55 cents; solid rock, $1.25. Mr. Darling, however, used only the figures for solid rock, $1.25, and "earth," including everything except solid rock, 33 cents. In the Spokane Case, he had made use of four classes: earth, 28 cents; hard pan, 42 cents; loose rock, 50 cents; solid rock, $1.10. In all cases these figures were intended to include work done by the company, as well as the amounts paid the contractors. See testimony of A. H. Hogeland, Minnesota Rate Cases, Record (G.N.), page 13; of W. L. Darling, *ibid.* (N.P.), page 3212.

[4] Minnesota Rate Cases, Record (N.P.), pages 41, 42, 68, 69.

pockets all of the data on the pound basis. So that he had a right to assume that as an intelligent basis upon which to consider locomotives, because locomotives vary in weight. . . . He did not know of a more convenient unit to apply than that.'[1] In short, Mr. Morgan adopted the rule-of-thumb measure (a figure used by railroad men to gauge, very roughly, relative costs, as new and bigger engines are built) as the basis of an estimate of the "cost of reproducing" locomotives. This, in the case of the Northern Pacific, he reported to the Commission as $3,230,790.51, etc. And, it must be remembered, the distinguishing feature of his appraisal was its "thoroughness."

The figures for all "cost of reproduction" estimates, though immediately depending upon the expert opinion of engineers, have, of course, been based to a greater or less degree on prices paid by the railroads. Even Mr. Darling's attempt at a prophecy over a period of ten years used prices which approximated those currently paid. But there is a difficulty even in the use of present prices which forces resort to approximation: this is the fact that similarity of problem does not exist upon all lines of railroad. Were all other things equal, a "present price" appraisal might take prices paid currently in one section of the country or upon one road, even upon one branch of the same road. But the fact remains that all other things are not equal, that rates of wages vary over the country, that construction materials (lumber, concrete, steel) likewise vary, that different construction problems are presented. Moreover, prices do not remain stable throughout a year. There is necessarily difficulty in picking out figures not vitiated by some peculiar set of circumstances. A general approximation may, perhaps, be made, but that is all.

[1] Minnesota Rate Cases, Record (N.P.), pages 1781–82. See Report of W. S. Thorington, Special Master, Central of Georgia Case, page 138, where "pound" prices were also applied to cars (page 139). Mr. Morgan took the car as the unit, however.

III

Conceivably allowance might be made for the "overhead" charges by including cost of engineering, promotion, etc., in the unit prices. In practice there has been no resort to this expedient. Freight charges, fixed for "average" distances, have sometimes been so included, though practice here has not been uniform.[1] Cost of handling rails and other materials has likewise been swallowed up in the unit price.[2] But for the items covering cost of general supervision, financial and legal as well as technical, practice has resorted to the use of "average" percentages, applied to all roads alike, as was the "contingencies" allowance.[3] In these instances, too, some variation has appeared in the case of different appraisals, as to the items which should be included in the totals. But the policy has in general been to determine the allowance for engineering and legal expenses by multiplying the "cost of reproducing" the permanent way and structures (including land) by the percentage chosen; and that for organization through using the entire total. These expedients, first used by M. E. Cooley in the Michigan appraisal, therefore represent the approved "valuation" practice.[4]

[1] In figures presented in the Minnesota Rate Cases, Mr. Darling, of the Northern Pacific, included the cost of freight, roughly estimated, in his "unit prices." Record (N.P.), pages 945–52 and 3219–20. Mr. Hogeland, of the Great Northern, introduced a separate item for "Freight on Construction." Record (G.N.), pages 48–51. Mr. Morgan followed the latter practice, using a lower basis for his calculation than either Mr. Darling, or Mr. Hogeland, Record (N.P.), pages 1942, 1950; (G.N.), pages 1381, 1464; see testimony of J. F. Stevens, Record (G.N.), page 459.

[2] The Minnesota Rate Cases, Brief for the Companies, pages 305, 307.

[3] An exception to this rule was the "valuation" of the Northern Pacific made by Mr. Berry, of the Rock Island, using the "unit mile" system of appraisal (see note 2, page 70, above). He estimated "legal expenses" at $50 per mile, "general expenses" at $100 per mile, etc. For "engineering," however, he used the percentage method. Minnesota Rate Cases, Record (N.P.), Complainant's Exhibit 26 — Berry.

[4] See *Senate Report on Valuation*, pages 172–74, where the allowances for "overhead" charges are given in detail.

Though the method of calculation has been essentially the same for all appraisals, the percentages used have varied according to the personal opinion of the engineer making the appraisal. This would be the normal expectation when it is recognized that the percentage allowance is only an "average" figure. But in each of the State appraisals, the same percentage has been applied generally to all roads. Mr. Morgan's charge for engineering and superintendence was four per cent.[1] This figure he used for all roads in the State: main lines and branch lines; roads of high physical standards, and those of low; terminal companies as well as the transcontinentals. There was no attempt to differentiate between the Great Northern, with over two thousand miles of main track, and the Mason City and Fort Dodge with twenty-seven, or between these and the Minnesota Transfer Railroad, etc.[2] Nor has there been attempt at intelligent discrimination in any of the other State "valuations." The percentages have been adopted to cover engineering, legal expenses, organization, and applied to all cases quite automatically. Detailed consideration, therefore, need not hold us here.

It is worth while, however, to pause for the moment to show the method by which the percentages adopted have been chosen. To the uninitiated it might appear that the figures chosen were "expert" guesses. If we are to accept the assurance of the engineer who made the South Dakota appraisal, Mr. C. C. Witt (later on the staff of the Interstate Commerce Commission), the contrary is true: "Extensive research has demonstrated that the cost of this item [engineering] . . . is equivalent to four per cent of

[1] On all items exclusive of equipment, legal expense, freight on construction material, stores and supplies, contingencies, and interest during construction, *Senate Report on Valuation*, page 172. See *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 71.

[2] These instances, simply taken at random from his report, are found at pages 82, 83, 84, *ibid.*

the roadway and right of way." [1] This, as a matter of fact, has been the percentage used in Minnesota, Michigan, South Dakota, Nebraska, and Wisconsin. In Wisconsin and Minnesota the allowance for engineering was combined with that for legal expense, one half per cent — a total of four and one half per cent.[2] The adequacy of the "research" seems doubtful, if the method by which the percentage allowance for engineering and legal expenses was chosen in Minnesota can be taken as at all typical. It is Mr. Morgan testifying:

> "Q. Will you explain how you arrived at the proper percentage used . . . four and one half per cent?
>
> "A. There are some of these things that have been done deductively. Probably no one can estimate with mathematical exactness what the percentages should be, but in order to arrive at this in an intelligent way, I listed the percentages on this item that had been turned in by the various railway companies that had submitted reports for this appraisal. I found one railroad that showed .88 of one per cent; one railroad . . . 1.3 per cent; eleven railroads, 4½ per cent; four . . . 5 per cent; one . . . 5½ per cent; one . . . 5.7 per cent; one . . . 6 per cent; four . . . 10 per cent; and two . . . 15 per cent. The consensus of opinion seemed to show that 4½ per cent for engineering, superintendence and legal expenses was a fair rate to apply, and for that reason we adopted that rate." [3]

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[1] *First Report*, Public Utilities Commission of Kansas, page 29. Mr. Witt had begun an appraisal in Kansas when the work of the Federal Valuation halted his activities. A "cost of reproduction" estimate of the Union Pacific was completed. *Ibid.*, page 33.

[2] Again there has been some variation in the basis for calculation. See *Senate Report on Valuation*, pages 172–74.

[3] Minnesota Rate Cases, Record (N.P.), pages 1851, 2032, 2037.

"Research" of the same general character was outlined in the testimony of W. L. Darling, *ibid.*, pages 13 and 3239; and of J. B. Berry, of the Rock Island, *ibid.*, page 744; of A. H. Hogeland, Record (G.N.), page 52. See remarks of G. F. Swain (the *New Haven Validation Report*, page 85), and especially his comparative table (page 123), where four sets of "overhead" charges are listed on the same property varying (in total) from 16 per cent to 33 per cent.

Testimony of this character indicates an entire absence of "research." The figure chosen was a guess, necessarily an "average" figure, intended to apply indiscriminately. In any case only an estimate could be made; and, by and large, four and a half per cent was perhaps just as near the truth as would have been seven per cent, or three. For the present purpose it is enough to indicate that any accuracy claimed for an estimate of "valuation" which includes such percentage allowances is specious.[1] Without pausing to consider in detail promotion, organization expenses (the so-called "general expenses"), it is possible, therefore, to turn to the item of "interest during construction."

Any allowance for interest is a function of two variables, a rate and a period of time. The rate used has been the usual guess of the engineer, who, it might seem, would be more at home in fixing upon unit prices for construction quantities than in attempting solution of so difficult a statistical task as determining a "normal" interest rate. Be that as it may, four per cent was used in Minnesota, three per cent in Michigan and Wisconsin, six per cent in Nebraska and South Dakota, five per cent in Washington.[2] G. F. Swain, in the New Haven appraisal, used six per cent, "a rate a new company intending to build a road would have to estimate upon."[3] In discussion of the subject by railroad men an allowance of a "fair and reasonable return" on the investment has been suggested.[4]

[1] The New York Public Service Commission, First District, has broken away from the percentage method of fixing the "cost of reproducing" overhead costs, using a lump sum allowance instead. For a discussion of this attitude in detail, see "Valuation Decisions of the New York Public Service Commission, First District," by R. H. Whitten, *Proceedings*, National Association of Railway Commissioners, 25th Annual Meeting, page 400.

[2] *Senate Report on Valuation*, page 171.

[3] The *New Haven Validation Report*, page 88.

[4] By W. H. Williams of the Delaware & Hudson, *Railway Age Gazette*, volume 46, page 762. Another writer (anonymous) in the same periodi-

Once a rate has been fixed upon, no attempt to vary that rate, as between different roads, has been made by the State engineers. Like the percentage allowance for "overhead" charges, the same rate has been regularly applied to all of the lines appraised. The period of time has usually been made to vary; but not always. In Michigan and Wisconsin the allowance of three per cent was blanketed to cover all roads, without regard to any hypothetical construction period. In Minnesota, South Dakota, Nebraska, and Washington, the construction period was made to vary, though a most curious underlying assumption was made.

It has generally been assumed that "on the average" the rate of interest (itself an arbitrary rate) [1] should be charged against the total cost of reproduction for half of the construction period. In Minnesota, having assumed a construction period of four years, Mr. Morgan added eight per cent to his cost of reproducing the Northern Pacific, four per cent to that of the Burlington, the Rock Island, Chicago Great Western, etc. His "idea was that it would not be necessary to borrow all of the money or to raise all of the money at once, but it would be raised in such a way that it would be all in use for practically half of the time required to construct the line." [2] Mr. Morgan assumed that his roads would be constructed all at once, and that no one portion would be placed in operation before any other portion, an assumption in which he was followed by the railroad witnesses.[3] In South Dakota, each line was divided into sections of one hundred miles, which, by the

cal suggested ten per cent, a rate "corresponding to the reasonable return which the carrier is entitled in law to realize." *Railway Age Gazette*, volume 46, page 221. See also the Valuation Brief of 1915, pages 108–114.

[1] D. C. Morgan, Minnesota Rate Cases, Record (N.P.), pages 2048 and 2049. See his report, *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 28. W. L. Darling, Record (N. P.), page 577, described his allowance as "simply arbitrary."

[2] *Ibid.*, page 2050. See pages 1855–59.

[3] W. L. Darling, *ibid.*, pages 13, 3239; A. H. Hogeland, Record (G.N.), pages 52 and 161.

hypothesis, could each be reproduced in one year. Accordingly interest was figured for one half year at six per cent.[1] In Nebraska, however, a "working section" of only sixty-five miles was chosen as the unit, and the interest charge of six per cent allowed for one and a half years, a construction period of three years being assumed, etc.[2] To cite further illustrations of the entirely arbitrary practice in this respect would only serve to encumber an argument already conclusive. The allowance for interest has been determined by use of the expedient now so familiar — resort to an "average," an assumed normal, or "fair," or representative figure.

IV

In the Minnesota Rate Cases, the Master and Judge Sanborn failed to make deduction for accrued depreciation, though they had before them the decision of Justice Moody in the Knoxville Case, insisting that such failure "would lead to obviously incorrect results."[3] When the case came to Justice Hughes, he simply relied upon the earlier conclusion of the Court without supplementing this with his own reasoning. "When particular physical items are estimated as worth so much new, if in fact they are depreciated, this amount should be found and allowed for. If this is not done the physical valuation is manifestly incomplete."[4] But how the amount to be deducted should be determined, Justice Hughes nowhere intimated.

The process of calculating the amount of the accrued depreciation is much complicated by the fact that obsolescence is so important a consideration in railroad operations.

[1] South Dakota Railway Appraisal, *Summary* (1910).

[2] *Fourth Annual Report*, Nebraska Railway Commission, page 450 and following.

[3] Knoxville *v.* Knoxville Water Co., 212 U.S. 1, 9.

[4] Minnesota Rate Cases, 230 U.S. 352, 458.

"Progress of the arts" has quickened the force of the inevitable physical wasting. "The whole conduct of the business has changed so that many cars are put out of use, not because they are worn out, but because they become unprofitable or antiquated in form. Powerful engines are required; the old draft-rigger wouldn't hold a train together." [1] Change in the weight of trains and cars has meant the rebuilding of bridges, the use of heavier rails, the enlargement of side tracks. Not infrequently considerable portions of the road bed have been abandoned, in grade revision, and curvature elimination. The passenger station, fully adequate to serve the business of twenty years ago, has become inadequate, "out of date," and replacement has been made. The experienced railroad man can cite examples of "obsolescence" almost without end.[2]

The effect of obsolescence upon the task of appraising accrued depreciation is twofold. In the first place, the data upon which to base calculations for the future are rendered slender. To what extent does treating ties extend their life? Can experience with a Prairie type locomotive be taken as indicating the length of life of a modern Mallet Compound? There is substantially no information upon which to gauge the probable working period of the new steel passenger or freight equipment. Experience with wooden cars indicates nothing conclusive about the newer productions. What is the effect upon rails of the use of this heavier equipment? The railroad business is essentially in a "dynamic" state. This weakens the possibility of securing really reliable data upon which to base estimates of depreciation.

In the second place, what of the future? If change has come in the past, must not change be expected in the

[1] J. J. Hill, Minnesota Rate Cases, Record (G.N.), page 1301. See testimony of E. P. Ripley, Evidence, 1910 Advances, page 24; and that of Daniel Willard, *ibid.*, page 2360.

[2] Howard Elliott, Minnesota Rate Cases, Record (N.P.), pages 1251–53.

future? Who is to say how much longer a given station building will remain adequate for the use of patrons, however much the presence of an old building may gall local pride? Can it be assumed that no heavier locomotives are to be built; that still stronger bridges may not be needed? That realignments are to stop, that no new tunnels will be built, or old ones abandoned? Before an "expert" can judge, however gross be the approximation, the proportion of the original investment used up, he must know (or guess) the probable total length of life of the "physical asset" being appraised, as well as its present age.[1] Will electricity be used more widely for motive power, displacing steam? Or if steam persists in use, will larger engines be built, or will there be a swing back to smaller types? Will the Grand Central Terminal in New York last fifty or a hundred years, or a thousand?

One of two possible expedients (or a use of both combined) has been the general plan. Inspection has been depended upon, subject to all the vagaries of expert judgment; or, life tables, based on "averages," have been applied, where sufficient data have existed to afford a basis of calculation, however uncertain. In either case the limitations governing the final figures are significant. Where inspection is depended upon, a tendency to minimize the amount of the deduction can be expected.[2] And when en-

[1] In the New York Gas Case, the witness for the Public Service Commission testified that his estimate of the depreciation was based on an assumed life for the plant that included allowance for probable future changes in the arts. The Master declined to approve a mere "theoretical deficiency." Accordingly he included plant that, it was alleged, was to be scrapped in the near future, "valued" on the basis of a detailed examination. Report of A. H. Masten, Special Master, page 175. Willcox *v.* Consolidated Gas Co., 212 U.S. 19. Portions of the line, included in the Minnesota valuations at undepreciated "cost of reproduction," were soon to be abandoned. Testimony of W. L. Darling, Minnesota Rate Cases, Record (N.P.), page 559. See the Valuation Brief of 1915, page 211.

[2] See *Report* of the St. Louis Public Service Commission on Rates for Electric Light and Power, page 59. "In depreciating, to arrive at the present value of the depreciable property, the Commission does not con-

tire dependence is placed upon "average" figures, the special conditions governing the individual plant (weather, volume of business, care in maintenance, etc.) are automatically thrown aside. But to contrast a deduction "based upon certainly ascertained inspection or investigation," with one based "upon the more or less conjectural allowances estimated by tables," is not valid.[1] The result is only a rough approximation in either case.

But here, as elsewhere, the "valuations" made by the States have presented figures purporting to be accurate to the final cent. The Washington "valuation" applied the use of "life tables" to parts of the depreciation problem. This expedient rendered "useless" any field inspection of equipment and structures. The life tables drawn up were not, however, based upon study of any "mortality" records of the roads whose property was appraised. Instead Mr. Gillette, the Chief Engineer, simply referred to the "well-established fact" that a freight car has a useful life exceeding twenty or twenty-five years. So, "if the *average car* has a life of twenty-five years it loses four per cent of its life every year. Hence by multiplying its age in years by four per cent, its lost life or depreciation is *ac-*

sider it fair to make deductions for anything but the present physical condition, and for items where it is plainly apparent that the property has become obsolete or inadequate. The usual estimate of the life of different parts of a public service property, so far as they deal with obsolescence or inadequacy, are extremely problematical and these elements should not be generally taken into account in determining present value."

The Valuation Brief of 1915 (page 256): "In the past many items of property have been retired because of obsolescence and inadequacy. The causes of the replacements do not appear in the records of the carriers, and it is impossible to ascertain therefrom what replacements were due to age and use. As obsolescence and inadequacy are not to be considered in the ascertainment of cost of reproduction less depreciation, there are no statistics, either in the carriers' records, or elsewhere, which furnish reliable information as a guide to determine the average life, when use and age alone are considered, upon which to make mortality tables."

[1] Gately & Hurley *v.* Delaware & Atlantic T. & T. Co., 1 N.J.B.P.U.C. 519, 551.

curately ascertained." [1] Making an allowance of ten per cent of original cost for salvage, and assuming a life of twenty-five years, he secured a rate of 3.6 per cent per year.

The purely arbitrary basis of this assumption is further emphasized by the fact that the same figure (3.6 per cent) was applied to all roads alike, and to freight and passenger cars indiscriminately, and to locomotives.[2] But the "findings" of the Washington Commission are so incomplete that the exact method of calculation of the amount of accrued depreciation does not appear. It seems certain, however, that average was piled on average. For example, the freight cars of the Northern Pacific (the "*cost of reproduction*" being calculated as *$8,040,254.90*) had been in use "an average of 8.2 years, with an annual depreciation of approximately 3.6 per cent." Accordingly "the *present depreciated value* of such freight equipment" was found to be *$5,668,379.72*. This same equipment had *cost new* (so the report found) *$5,665,563.95*, or about $3000 less than the "present value," calculated on the "cost of reproduction less depreciation" hypothesis. Since the latter figure is exactly 70.5 per cent of the "cost of reproduction new," the conclusion seems not unwarranted that the amount of the accrued depreciation was determined by using the "average life" as a multiplier.[3] Yet this manipulation of averages and approximations brought results which, as reported, assumed entire accuracy. By substantially similar methods Mr. Gillette found the amount of accrued depreciation in buildings.[4] Enough has been said, however, to

[1] *Second and Third Annual Reports*, Railroad Commission of Washington, page 44. The italics are the writer's.

[2] *Ibid.*, page 156, N.P.; page 282, G.N.

[3] *Ibid.*, page 156. The product of 3.6 and 8.2 is 29.52.

[4] *Ibid.*, page 45. See page 289 where the "value" of the Great Northern shops, roundhouses, and turntables is shown as "approximately 84 per cent" of the "value new" (cost of reproduction). Throughout the report the phrase "cost of reproduction" is assumed as equivalent to "value," and is used indiscriminately with it.

indicate the lack of binding significance in such conclusions.

When it is realized that *inspection* seeking to measure depreciation has been similar to that used in checking inventories taken from the records, the entire lack of accuracy is again readily apparent. Yet Mr. C. C. Witt, the South Dakota Chief Engineer (his inspection like that in Minnesota and Nebraska was made from a slowly moving train), could report to that Commission: "The present actual condition of each item due to use or decay was noticed and a condition per cent based on a new or one hundred per cent condition was placed opposite each item on the inventory." [1] In the New Haven Validation appraisal, though the entire mileage was covered in twelve days, it was "the unanimous testimony of every one" that the road was "maintained in remarkably good condition." The depreciation percentages were "fixed accordingly," with but three exceptions, on a figure which was a multiple of five.[2] In the Michigan and Wisconsin appraisals everything was left to the judgment of the individual inspectors. Mr. Cooley's report to the Michigan Tax Commission did show that "about 33,000 freight cars were inspected," that "experienced railroad engineers . . . made a personal inspection of all the separate items . . . ties, rails, frogs, switches, etc., . . . the condition," etc.[3] If this inspec-

See Report of W. S. Thorington, Special Master, Central of Georgia Case, pages 138–41. Here different rates of depreciation were used for different classes of locomotives, for wood and steel cars, etc.

[1] South Dakota Railway Appraisal, Report of C. C. Witt (1910), page 9.

[2] These percentages were applied to the total for each group of the inventory; e.g., cost of reproduction new (Mr. Swain called this "value") of rails was $8,775,985; their condition, 80 per cent; etc. The summary is found in the *New Haven Validation Report*, page 133; the discussion, page 91. Mr. Swain felt that the figures submitted over his signature (they had been made "with as much care as the time would permit") were "exceedingly fair and reliable," "low," "conservative" (page 91); "safe and reliable" (page 127).

[3] Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway*

tion was really made, it is difficult to see how Mr. Morgan, of Minnesota, justified his claim to greater thoroughness. For, let it be recalled, the most that he did was to stop his train "every mile in places, but usually every two miles and sometimes every five miles." [1] Except as making possible a determination of the standards of "maintenance" without reliance upon reports of subordinates, it is difficult to see that this process was necessarily more accurate than that in the New Haven appraisal.[2] In neither case was the accuracy warranted which the completeness of the figures reported would imply. Mr. Swain reported a "present valuation new," for the New Haven of $304,601,824, a "present valuation depreciated," of $263,601,136; Mr. Morgan, a "cost of reproduction new," of $69,397,954.87 for the Minnesota lines of the Northern Pacific, a "present value" of $61,099,563.40. The corresponding figures for the Great Northern were $107,074,102.18 and $94,415,342.69,[3] etc., etc.

Operating Property, page 77; see page 83, the "plan" of W. D. Taylor, the Wisconsin Chief Engineer.

[1] *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 23. In the Washington appraisal, where inspection was used for properties other than structures and equipment, the estimates were prefaced by "approximately." Thus the "present value" of bridges, trestles, etc., on the Northern Pacific was "approximately 84.7 per cent." *Second and Third Annual Reports*, Railroad Commission of Washington, page 155.

[2] The most absurd performance of all — no milder phrase is adequate — was that of the Wisconsin Commission in Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1 (1910). An appraisal made in 1897 had omitted to estimate any accrued depreciation. "It is probable, however," said the Commission, "that the property was in what may be regarded as about a 77.62 per cent condition" (page 87).

[3] The *New Haven Validation Report*, page 134. Mr. Swain called "cost of reproduction," "value." *Supplement, Report*, Railroad & Warehouse Commission of Minnesota, 1908, pages 82 and 91. Mr. Morgan's figures are all given with the same fullness, pages 36 to 158. See also the reports cited above, page 31.

CHAPTER IV

PHYSICAL VALUATION
"COST OF REPRODUCTION" (*concluded*)

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Agricultural land, 86. — Urban land, 87. — Terminals, 89. — The Minnesota Rate Cases, 90. — Capital goods, 94.

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Courts and Commissions, 97. — The engineers, 97. — The private interest, 101. — "Cost of reproduction" and the "long run" cost of producing transportation service, 102.

To this discussion of "cost of reproduction" can now be brought a significant passage from the Minnesota Rate Cases: "The cost of reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied, and when the cost of reproducing the property may be ascertained with a proper degree of certainty." [1] This sentence standing alone is quite characteristic of the guarded manner in which the Court has always treated the valuation problem. The range of discretion is necessarily wide. What is a "reasonable" application of the "cost of reproduction" method? What is a "proper degree of certainty"? So far as Justice Hughes may be said to have voiced a standard it is found in his refusal to accept "results which depend upon mere conjecture." [2]

I

Justice Hughes' criticism went to the heart of the "cost of reproduction" hypothesis, and especially as that hypothesis has been applied to the "valuation" of land.

[1] 230 U.S. 352, 452. [2] *Ibid.*

The expedient used by both parties, it will be recalled, had been a "valuation" of the railroad land based upon the value of adjacent tracts. That the House draft of the Valuation Law provided for the determination of the "present value of all lands, rights of way, and terminals . . . ascertained by comparison with adjoining lands," is testimony to the strength of the tradition.[1] And this tradition is, of course, a simple corollary of the condemnation analogy, and its concomitant, the "cost of reproduction" hypothesis. For this hypothesis assumes that the value of the adjacent land, due in part to the presence of the railroad, shall persist even though the railroad is conjured away. To what extent, if at all, is the hypothesis valid?

Take first the situation of agricultural land: eliminate the railroad; what would the land be worth, deprived of a mode of transporting to market? Or take the case of a railroad built into a virgin territory: land formerly not worth cultivating can at once be tilled. Or if the road brings transportation facilities nearer to areas already

[1] Amended in the Senate. See *Senate Report on Valuation*, page 20.

The scope of the Federal investigation is outlined in the following quotation from an address of Director of Valuation Prouty before the National Association of Railway Commissioners (*Proceedings*, 26th Annual Meeting, page 136). No originality of method is apparent in the investigation here outlined: a combination of tax ratio, and opinion and sales "value" — and judgment! "Now there are a great many questions in reference to land which are very difficult and delicate questions, and which must be passed upon by the Commission finally. Those questions have not been reached by us up to the present time, and the work which we are doing now merely concerns the collection of facts with respect to land. In other words, we are attempting to ascertain, and we are only attempting to ascertain, what is the value of *similar adjacent and adjoining lands*. In doing that we look into the *tax assessment* of similar lands, *endeavoring to ascertain the relation between that assessment and the actual value* of the land. We look into the actual sale of similar lands, comparing them with one another. We take the *opinions* of people who are qualified to judge, and *our land appraiser, from all those sources, makes up his mind* and so reports as to the value of similar adjacent lands." The italics are the writer's.

See circulars issued by the General Secretary of the Presidents' Conference, dated October 30, 1914, November 30, 1915; and May 14, 1916.

served, a parallel increase in value appears, with the lessening of cost of haulage to the railroad. In either case wider markets are made available; normally "economic rent" must increase; the adjacent lands are more valuable. So much is commonplace history of the American West.

Or consider the value of land in villages and the smaller towns served by a single road. Not infrequently the railroad itself, especially when extending into relatively unsettled areas, has plotted the town sites, and sold single lots for sums which, before the coming of the road, would have bought acres. Sometimes an enterprising promoter has done the work of exploitation. But in either case, depriving the town of the railroad would destroy the site rent. The land would become valueless (except where available for agriculture). Again the value of lands adjacent to the railroad is seen to depend directly upon the presence of the railroad.[1]

Nor is the situation different where a number of roads have centered, and a city — large or small — has grown up. Even where location on a navigable waterway originally

[1] The following testimony of J. J. Hill in the Minnesota Rate Cases is here pertinent:

"Q. Now, it has been suggested that the location of a railroad in the different towns and cities and villages through which it passes has a great deal to do in considering the value of the property; if the location is central and convenient to the business, it is one thing, and if it is remote and on the outskirts of a town, it is another thing. Now, how is the Great Northern Road, in the State of Minnesota, generally speaking, located in the different towns and cities and villages through which it passes?

"A. Well, it was very largely located and built there before the town was; the town formed on the railroad.

"Q. Does that have a direct influence on the business which the Company gets?

"A. The railroad was in the middle of the business; the business formed around it, and it was more convenient, much more than if it had located some distance out.

"Q. Taking the location here, in the city of St. Paul and in the city of Minneapolis, is that true here as in the other places you have referred to?

"A. Yes, sir."

Record (G.N.), page 1290.

marked out a spot for settlement — typical illustrations are the "fall line" cities in the South, and the cities at strategic points on the Mississippi — the coming of the railroad has meant increasing population in the city itself, and in the surrounding country.[1] A navigable waterway has not been essential; "railroad" towns have developed at junction points. Perhaps the most conspicuous case of the railroad center, *per se*, is Atlanta, where converge the lines into the Southeast from the North and West. A great industrial and commercial city has been the result. And varying only in degree, the same is true of nearly every American town. The "cost of reproduction" hypothesis as applied to land simply closes its eyes to this relationship. The value of urban land — in city or town — is itself dependent upon the presence of the railroad. "If there were no railroads in Chicago, there would be no Chicago."[2]

[1] Adna F. Weber, *The Growth of Cities*, pages 197–204, summarizes the influence of railroad building upon city growth.

[2] Evidence, 1910 Advances, page 1002; testimony of Mr. Ward, General Manager of the C. B. & Q.; Mr. Lyon, the attorney for the Commission, cross-examined Mr. Ward (pages 1001–10):

"Mr. Lyon. Why, in valuing this property, did you base it upon surrounding property used for other purposes?

"Mr. Ward. Because I was attempting to get at the valuation for reproducing our property, and that seemed to be the only practicable basis to use.

"Mr. Lyon. If your railroad was entirely removed, would you express any opinion as to what adjoining property would be worth? . . .

"Mr. Ward. It would undoubtedly decrease it.

"Mr. Lyon. So the value of the adjoining property upon which you estimate the value of the railroad property is valuable because the railroad is there?

"Mr. Ward. Partly so; yes, sir.

"Mr. Lyon. And therefore do you consider the fact that there is an operating railroad there makes the value of the adjoining property to a large extent? That is true to a large extent, is it not? . . .

"Mr. Ward. Yes, sir; it draws part of its value from that fact.

"Mr. Lyon. Is the right of way estimated the same way?

"Mr. Ward. Yes." (Page 1002.)

And further:

"Mr. Lyon. And that land which you say you would not give $25

Especially strained is the theory which within a given city measures the value of terminals by the value of adjacent lands devoted to business purposes. Sites near the railroads are sought after for business purposes, because such location means more economical handling of goods in and out of the plant. The possession of a side track where delivery to the road can be made without team handling is an advantage for which the industry is ready to bid. For elevator and warehouse purposes such ready access is all essential.[1] And even where delivery must be made to a

an acre for in western Nebraska you include in this group at $2000 a mile, which is $165 an acre?

"Mr. Ward. You understand that includes our station grounds, as well as the ordinary right-of-way strip.

"Mr. Lyon. Station grounds?

"Mr. Ward. Yes, sir.

"Mr. Lyon. You could buy enough ground in western Nebraska to put all your stations on for $25.

"Mr. Ward. *Oh, no.*

"Mr. Dawes. *Not located at the stations.*

"Mr. Ward. *Not located at the stations.*

"Mr. Lyon. That is another case in which land at the station becomes more valuable because the railroad is there, and therefore it should be capitalized and rates paid on it?

"Mr. Ward. Exactly." (Page 1006.)

See also testimony of L. B. Elwood in the Minnesota Rate Cases, Record (N.P.), page 1046, and of J .F. Stevens, *ibid.* (G.N.), pages 473–74; and the Report of W. A. Gunter, in the Louisville & Nashville Case, page 84, which indicates that the issue was there raised; also Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 803.

[1] J. J. Watson, one of the St. Paul appraisers, Minnesota Rate Cases, Record (N.P.), page 524 and following, especially page 527; and Charles Hayden, the Assistant Right of Way Commissioner of the Great Northern, Record (G.N.), page 276.

The following is from the testimony of O. L. Taylor of the St. Paul appraisers:

"Q. Now, of course, when you speak about the property being more valuable in the wholesale district, you are considering adjacent property, aren't you?

"A. Yes, the adjacent property. . . .

"Q. It would be impossible for you to say whether the railroads had given the value to the wholesale property or the wholesale property had given the value to the railroad property, wouldn't it — you can't tell that?

freight house, land nearer the terminal normally possesses a differential advantage measured by the difference in teaming costs. Competition for these desirable locations consequently means valuations measured by the capitalization of the differential in terms of dollars and cents. Except for the presence of the railroad in the river bottom the business district of St. Paul would hardly have concentrated in its present position. And the fact that the Northern Pacific secured high rents for sites located along its tracks proved nothing about the value of the same lands were the road removed. This is again the most elementary economic theory.[1]

Justice Hughes did not hesitate to challenge the "speculative" nature of the "cost of reproduction" hypothesis as applied to the conjectured cost of reacquiring land. "The railroad," he said, "has long been established; to it have been linked the activities of agriculture, industry, and trade. Communities have long been dependent upon its service, and their growth and development have been conditioned upon the facilities it has provided. . . . The assumption of its non-existence, and at the same time that the values that rest upon it remain unchanged, is impossible and cannot be entertained." [2]

Had Justice Hughes stopped with this incisive analysis

"A. No; I think there has been a mutual effect.

"Q. Mutual effect; it has all gone on together?

"A. Yes.

"Q. And when you come to the point of one eliminated and the other existing, you are getting into a range of speculation which a hard-headed real estate man like yourself doesn't indulge in, isn't that so?

"A. True, yes." Record (G.N.), page 490.

[1] See Brief of J. M. Woolworth, page 59. Smyth *v.* Ames, 169 U.S. 466. Similar reasoning can be applied in essential particulars to the case of passenger terminals, though the relationship is here one to the entire business section as contrasted with the factory and warehouse section.

[2] Minnesota Rate Cases, 230 U.S. 352, 452. This, of course, directly overruled Judge Sanborn, Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 803. See, however, a circular issued by the General Secretary of the Presidents' Conference, dated May 14, 1915.

of the adjacent land test, the decision in the Minnesota Rate Cases would constitute a more helpful guide to a discussion of the problem of land "valuation." But apparently seeking to protect the Court from too positive a statement overthrowing the tradition of practice, he introduced a new complication. Making certain assumptions (but without committing the Court to the assumptions), he suggested a programme for land appraisal which aimed to set the maximum, should the assumptions be held valid. His words are, therefore, from the point of view of judicial authority, mere *dicta*, — "*Assuming* that the company is entitled to a *reasonable* share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increase so allowed . . . cannot extend beyond the fair average of the normal market value of land in the vicinity having a similar character. Otherwise we enter the realm of mere conjecture." [1]

"*The fair average of the normal market value of land in the vicinity having a similar character*" — what does it mean? Does this in any sense eliminate the element of speculation and conjecture? On the contrary, there is no such thing as a "normal" market value of land. The value of land is dependent upon the capitalization of the economic rent of that land. A *fair average* of a series of unrelated real estate values is quite as speculative as Mr. Morgan's attempt to group lands of similar character in order to apply his sales-assessment method. Not infrequently, too, the railroad occupies land which is the only land of that character for miles around. How apply Justice Hughes' test to the possession of the river-bank, or of the mountain pass? For any purpose, except for that of transportation, these sites might conceivably be quite valueless. Or in the village, is a line to be surveyed away from the existing line, and the value of lands located in the path of this substitute line applied to the acreage in the right of way? And take

[1] Minnesota Rate Cases, 230 U.S. 352, 455; the italics are the writer's.

the case of the terminal in the city. Who is to say which of a series of locations is suitable for a railroad—assuming that there is similar land in the city, that the railroads are not confined to a water front, again in many cases a conjecture contrary to fact? In a city there is by no possible stretch of truth such a thing as "similar land," as applied to large areas.

The value of a piece of land, the physical characteristics of which may be the same as that owned by the railroad, is determined by the "rent" which it will yield used for business or residence purposes. And the amount of this rent depends upon a series of complicated factors. Of these the presence of the railroad, as Justice Hughes himself pointed out, is one. Urban site rent does not depend upon fertility; it depends upon availability for other than railroad purposes. Urban land (including land in the smallest village as well as the great city) no more possesses a normal market value than does land in the agricultural country. It has no cost of production; its value is dependent upon the income which it will yield; and the amount of that income, even in the case where land of similar physical characteristics might be found, is dependent upon the presence of the railroad. The influence of the transportation facilities upon land values in city or country is not confined to the land immediately adjacent. Justice Hughes' proposed solution must fail, therefore, upon the two grounds on which he rejected the "adjacent land" test: conjecture and interdependence. The use of the phrase "fair average of the normal market value of land having similar character" simply served to hide a failure to continue economic reasoning in treating this portion of the problem.[1] It is

[1] J. E. Baker, "Valuation of Terminal Lands," suggests that the "values" allotted to terminals be what would be their value, if devoted to business purposes, the railroad removed, but the city remaining. "It is not difficult," he says, "for observers of population movements and urban conditions to determine quite accurately to what purpose a given location would be devoted if another hypothetical condition be assumed.

indication that the Supreme Court is still seeking a concept of "fair value."

The Court's assurance that "otherwise we enter the realm of mere conjecture" is not conclusive. Who but the expert is to say what land possesses a "similar character," especially in view of the peculiar need of the railroad for a site which conforms to standards for maximum grade and curvature? Justice Hughes' substitute for the "adjacent land" test must simply be written down as a resort to generality. It does not avoid the very difficulty which it purports to seek to avoid: the dependence of land values upon the presence of the railroad. The effect of the presence of transportation facilities upon land values is not limited to a strip immediately adjacent to the right of way.[1] To base a decision involving broad questions of public policy upon the opinions of "experts" testifying both as to "average value" and "similarity" of character would throw down the bars to a revelry in conjecture.

Justice Hughes also rejected "hypothetical outlays," including not only the "conjectural cost of acquisition and consequential damages" (covered by the land multiple), but also the sums calculated "on the amount taken as the present value of the lands," which were embraced in the items of engineering, superintendence, legal expenses, contingencies, and interest during construction.[2] These amounted in the case of the Northern Pacific to $4,099,790. In answer to Justice Hughes, it might well be

. . . If a Marshall Field store would be built upon it, use a Marshall Field price. But if a lot would be used for storing rags and old iron, mark it down to a remnant figure." *Journal of Accountancy*, volume 8, pages 246, 247.

[1] Thus Justice Hughes' proposal is seen to be no less conjectural than the so-called "sales and assessment" method which is based entirely upon the hypothesis of a "judicial process" working subconsciously; or upon the "sales" method which purports to check the "mental process" of the local real estate expert. See State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 528.

[2] Minnesota Rate Cases, 230 U.S. 352, 455.

asserted that he did not meet the issue fairly, since there had been no claim that the percentage figures were more than "average" allowances. The very hypothesis upon which the engineers made their estimates of cost for the "overhead," including "contingencies," was that the percentages, as calculated against the totals, were "fair"—not that they applied equally to each item of the inventory.[1] That the "contingencies" item, the "engineering" and "legal" items, and "interest" were dependent upon conjecture for their amount, and that to varying degree they covered "hypothetical outlays," is, however, true.

But for what item of "the cost of reproduction" is this not true? In the particular case which Justice Hughes was considering, the figures were not even "expert" guesses, being simply the arbitrary figures picked out of a maze of conflicting testimony by an attorney, entirely new to his task. But even had the Master simply accepted without change the estimates of the railroad engineers or those of Mr. Morgan for the State, the previous discussion has shown that conjecture was perhaps the largest source of information used by these authorities. The entire estimates represented "hypothetical outlays." The "cost of reproduction" is all hypothesis.

It hardly needs a summary of the conjectural factors to fortify this conclusion. The making of an inventory of physical units (or quantities) simply as such, without attempt to classify by standards of quality, of material, even of age (since allowance must be made for accrued depreciation), is necessarily tainted with a "large measure of error." Even "subordination of personality to system" can hardly eliminate those "individual errors of judgment . . . frequent in any work of magnitude." [2] But the task is not one of measurement and count alone, even where

[1] Above, page

[2] H. E. Ri on of Public Service Property," *Transactions*, Am. Soc., C 4.

well-defined specifications are imposed upon the engineer. The physical units, before they can serve a useful purpose, must be translated into terms of the monetary unit. Everywhere is found reliance upon expert knowledge, judgment, "acquaintance with the property," guessing, where guessing is "analogous" to a use of the judgment, — in short, reliance upon "railroad intuition."

The complication arising from inadequate inventory figures of unit quantities, in the records of the companies, and that due to lack of knowledge of the probable length of life of the railroad plant,[1] introduce the first elements of uncertainty into the appraisal. The measurement, count, and classification of the units (the last perhaps the most significant factor, since here "judgment" is supreme), and the estimate of the depreciation accrued, present the same inevitable resort to "average" figures, to approximation. The use of percentages for "overhead" charges is but further extension of the "average" short cut. And these difficulties are all met entirely aside from any determination of "unit prices."

Yet, were every other element determined within so narrow a range that the error was negligible, the necessity of providing "unit prices" would throw the entire "valuation" into the field of conjecture. "Unit prices" must be set by the same "experts" who draw up specifications. Resort to bulking, "averaging," the assumption of a similarity of condition which does not exist, etc., — these sources of error appear entirely apart from the general hypothesis. The latter determines whether the "prices" shall be "present" prices, "future" prices (the only basis true to a reproduction ideal), or "average" prices. Now add to these complications the necessity to appraise the accrued depreciation, and the task of the "valuation" engineer is presented in full.

[1] Because of failure to keep records in the past, and because of the necessity to consider the probable course of progress in the arts.

In hypothesis, everything is simple enough; determine the construction (and equipment) quantities, so subdivided and graded as to make possible the application of "fair unit costs," were the road to be "reproduced." With "cost of reproduction new" determined, how much of an investment made now would be unimpaired at a date when the "reproduced" unit should be depreciated to the condition of the existing unit? The task that this programme proposes is one which must be fruitless of significant results — simply from the point of view of statistical accuracy. The large degree of error, necessarily attaching, must vitiate the results for use in scientific inquiry, or for inquiry involving so broad a question of public policy as the return to the railroads, when that inquiry purports to use scientific methods. That the legal profession, with unreasoned dependence upon the "rule" in Smyth *v.* Ames, and the engineering profession, with optimism unwarranted by the degree of accuracy actually attained, have used such figures is evidence only of the hopelessness of the task. At best all that "physical valuation" — "cost of reproduction" — can do is to offer a very rough and uncertain approximation upon the hypothesis assumed. Figures asserting accuracy are as dangerous as they are fallacious. We need not marvel at Justice Holmes' protest against "delusive exactness." [1]

II

We turn now from the consideration of the large degree of error inherent in the "cost of reproduction" appraisal to that of the place of such an appraisal in a scientific (as

[1] Louisville *v.* Cumberland T. & T. Co., 225 U.S. 430, 436. The lower court had, however, recognized that "in a case like this, there is no possibility of scientific accuracy." Cumberland T. & T. Co. *v.* Louisville, 187 Fed. 637, 649. See Spring Valley Water Co. *v.* San Francisco, 165 Fed. 667, 685; citing eleven appraisals of the same plant, ranging from twenty-two to seventy millions of dollars.

differentiated from a *strategic*) measure of reasonableness.

"A fundamental, though not necessarily a controlling element in value, is cost of reproduction. This," declared the Railroad Securities Commission, "is true of property in general; it has been specifically affirmed of railroad property by the Supreme Court of the United States. Eminent railroad men who have appeared before this Commission have stated that in their opinion *cost of reproduction or physical value* was the most important single element in determining the true value of the railroad as a whole." [1] In this language is briefly summarized the point of view which the lower courts have generally adopted in their treatment of the valuation problem.

Resort to "cost of reproduction" can, in considerable measure, be accounted for on the ground that the engineers have consistently defined "present value" as "cost of reproduction, less depreciation." The State appraisals have here been at one with those made by private interests,

[1] *Report*, Railroad Securities Commission, 1911, page 18. The Commission continued: "Indeed, we believe it to be in the interest of railroads, no less than of those who use them, that the Interstate Commerce Commission should be given broad powers and adequate means for valuation of the physical property of railroads as one element in determining fair value, whenever, in the judgment of that Commission, this is of sufficient importance to warrant such action. This will give the public information which it is entitled to demand, and which can, in our judgment, be better and more economically obtained in this way than in any other."

Commissioner Prouty called "cost of reproduction, . . . one and perhaps the most important element in determining 'fair value.'" Eastern Advance Case of 1910, 20 I.C.C. 243, 261.

See, however, the incisive testimony of Mr. Frank Trumbull, of the Chesapeake & Ohio, before the Senate Committee, *Senate Report on Valuation*, page 38; likewise, J. F. Stevens, Minnesota Rate Cases, Record (G.N.), page 463; and J. J. Hill, *ibid.*, page 1351. Mr. Stevens thought "cost of reproduction . . . perfectly useless." Mr. Hill did not "want to testify absolutely" that to estimate "cost of reproduction" was to suppose "an impossibility." He recognized, however, that "the reproduction of a railway of 2000 miles is something that has never been done. . . . It is very hard to testify as to what would be accurate in a case that has never been done."

whether railroads or local public utilities.[1] The courts, finding the "experts" (who, be it remembered, have always been men of high professional standing) ready with a definition, seem never to have challenged the validity of their figures. There is no less an authority than a decision of the Supreme Court holding that "the cost of reproduction is one way of ascertaining the present value of the

[1] See Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 78 (Michigan); page 83 (Wisconsin); *Supplement, Annual Report*, Railroad & Warehouse Commission of Minnesota, 1908, page 30; *Second and Third Annual Reports*, Railroad Commission of Washington, page 41; the *New Haven Validation Report*, pages 152, 153; *Sixth Annual Report*, Nebraska State Railway Commission, page 522. See also Reports of the Masters in the Alabama Rate Cases; and the cases cited in Whitten, *Valuation of Public Service Corporations*, pages 67, 70.

When cross-examined by the attorneys for the State, A. H. Hogeland declared that his "valuation" of the Great Northern represented not "value," but "cost of reproduction." Minnesota Rate Cases, Record (G.N.), page 67. To the same effect, see testimony of W. L. Darling, Record (N.P), pages 3241–43. The following excerpt indicates the tenor of both examinations:

"Q. You have assumed, in giving this statement, that the method pursued by you for ascertaining the cost of reproduction under the circumstances described by you, is the proper method of ascertaining the value to be arrived at in this case?

"Mr. Darling. I have made no estimate on the value, Mr. O'Brien.

"Q. Made no estimate on the value?

"A. No, sir.

"Q. Well, in preparing these tables, do you mean that you did not proceed upon the theory that the cost of reproduction as given by you would show the value of the road, or that you simply adopted the theory which you were instructed to adopt?

"A. No: my problem in this was merely to produce the cost of reproducing the railroad at this time.

"Q. And in doing that you have taken the literal meaning of the word 'reproduction' and have carried it to the full extreme under all circumstances?

"A. I have given what I think is a conservative cost of reproducing the railroad." (Page 3243.) . . .

"Q. But as I understand it, you don't present your tables and testimony with the claim that they do establish the actual value of the Northern Pacific System, either in Minnesota or outside of Minnesota, as it exists at the present time?

"A. No, sir." (Page 3246.)

plant."[1] The lower court in the New York Gas Case could not observe "the continued use of the present tense in the decisions of the highest court, without feeling that the *actual or reproductive value* at the time of inquiry was the first and foremost figure to be ascertained."[2] Or, to take the holding in the Alabama Rate Cases: "After finding the original cost the question would still have to be solved as to whether such original cost is the same as the present value." This would "involve the determination of the present value for such comparison independent of original cost, and in no other or better way than on *reproduction value*."[3] It was sufficient for the Master in the Minnesota Rate Cases that the public, rather than dispense with the service of any of the roads concerned, could well afford to pay such rates as would "produce a full and fair return on their cost of reproduction." Indeed, the public would gladly pay such rates, since abandonment would be a great "calamity." If the roads were "suddenly obliterated, their immediate reconstruction would follow in response to the public necessity." This, to his mind, demonstrated that the roads "must be worth what it would cost to reproduce them," and that a return on such cost would not be "oppressive."[4]

[1] Knoxville *v.* Knoxville Water Co., 212 U.S. 1, 9; Minnesota Rate Cases, 230 U.S. 352, 452.

[2] Judge Hough therefore accepted a "cost of reproduction less depreciation" estimate of one of the company experts. See Record, Willcox *v.* Consolidated Gas Co., 212 U.S. 19, Master's Report, page 170; testimony, page 1313; also Consolidated Gas Co. *v.* New York, 157 Fed. 849, 855. The italics are the writer's.

[3] L. & N. R.R. *v.* R.R. Commission of Alabama, 196 Fed. 800, 820. The Court regarded "the reproduction cost as the final test of present value" (page 821). See Western Railway of Alabama *v.* R.R. Commission of Alabama, 197 Fed. 954, 961; Cumberland T. & T. Co. *v.* City of Louisville, 187 Fed. 637, 642; State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 579.

[4] Report of Chas. E. Otis, page 244. Mr. Otis here developed an original line of argument. His authority for the choice of "cost of reproduction" was B. H. Meyer, now of the I.C.C., who contributed to Bulletin 21, Bureau of the Census, on *Commercial Valuation of Railway Operating Property*, pages 19 and 51. Mr. Otis spoke of an "undepreciated value."

Thus "cost of reproduction," though ostensibly but a means toward an end, — the determination of "fair value," — has become confused with the end itself. The hypothesis, once adopted, has been applied with relentless consistency. The Master in the Minnesota Cases included bridges over the Minneapolis & St. Louis tracks in Minneapolis, because, though built by the city, "their repair and renewal must be borne by the company, and the city could not have been compelled to construct them if the law had been properly interpreted and observed." [1] The land "multiple" and the conjuring up of unbuilt structures have already been discussed.[2] Mr. J. F. Stevens, to whom a price of $1.25 a cubic yard for excavating solid rock seemed "at first glance . . . to be high," was reconciled to the price when he "found that a very large part of the 440,000 yards was located in the city of Minneapolis," where "it couldn't be done for any reasonable price." [3] Or, to take an illustration from the New York Gas Case, there is the imaginary expense of tearing up and replacing the street pavement, even though the present pavement was laid long after the pipes had been put in place, etc.[4]

Mr. Meyer was, however, discussing "valuation," and the division of "value" between the States, for taxation purposes. Even here his argument hardly seems entirely convincing.

[1] Report of Chas. E. Otis, page 231.

[2] Above, pages 33–37. See the *New Haven Validation Report*, page 88, on road crossings paid for in part by the Commonwealth.

[3] Minnesota Rate Cases, Record (G.N.), page 430.

[4] See cases cited and discussed in Whitten, *Valuation of Public Service Corporations*, pages 148–60; 970–89; and R. E. Heilman, "Principles of Public Utility Valuation," *Quarterly Journal of Economics*, volume 28, page 279.

The Master in the New York Gas Case, Report, page 177, Willcox *v.* Consolidated Gas Co. (212 U.S. 19), and the lower Court (157 Fed. 849, 855) both included in "fair value," not only this "cost" of pavement, but also the extra "cost" due to the fact that the subsurface of the street was now more crowded than when the mains were laid, and that a more expensive engineering task was presented.

"The value of the investment of any manufacturer in plant, factory, or goods, or all three, is what his possessions would sell for upon a fair

The Chief Engineer of the Washington Commission omitted the cost of exploring surveys, which had cost the Northern Pacific some $300,000, because, in the event of reproduction, such "elaborate exploration" would not be needed. The best route was known.[1] But in no case has the possibility been faced that were a road "instantaneously obliterated," grants of right of way and donations of terminals might again be made by communities so suddenly deprived of their transportation facilities.

Emphasis upon "replacement value" has furthermore been to the advantage of the local public utility companies (and probably, also, to that of the railroads) because of the present high level of prices and wages. The fact that the company in the San Diego Water Cases pleaded for actual cost as a legitimate basis — the plant having been built at boom prices — suggests that had the interest of the companies prompted gathering cost figures, the hopelessness of the task might have appeared less appalling. But the rise in construction costs has simply made possible a claim of another "unearned increment." [2]

transfer from a willing vendor to a willing buyer, and it can make no difference that such value is affected by the efforts of himself, or others, by whim or fashion, or (*what is really the same thing*) by the advance of land value in the opinion of the buying public. It is equally immaterial that such value is affected by difficulties of reproduction. If it be true that a pipe line under the New York of 1907 is worth more than a pipe line under the city of 1827, then the owner thereof owns that value, and that such advance arose from difficulties of duplication created by the city itself is a matter of no moment." To the Court "investment" became meaningless if construed to mean what the thing invested in cost generations ago. 157 Fed. 849, 855. (The italics are the writer's.)

[1] *Second and Third Annual Reports*, Railroad Commission of Washington, pages 42–43.

[2] In Steenerson *v.* Great Northern Ry. Co., 72 Northwestern 713, 715, decided in 1897 when the level of prices was lower than when the roads had been built, the railroad did plead for a "valuation" on the basis of cost. The Minnesota Supreme Court, however, used cost of reproduction: "If a railroad was built thirty years ago at a cost of $40,000 per mile, and another one equally as good was built within a year through the same territory at a cost of $12,000 per mile, on what principle should it be held that the old road was entitled to 3⅓ times as much income as the

To what extent there has been a conscious understanding of this element of self-interest must necessarily be difficult to say. Certainly the witnesses for the railroads in the Minnesota Rate Cases were not blind to the circumstance that the unit prices used were in many cases considerably above the amounts actually expended, even in the face of important technical improvements.[1]

But it was in terms of the *investment* (i.e., actual cost) that the calculations of the enterpriser and investor were made.[2] Of this amount, no inconsiderable portion was

new road? No guaranty was ever made by the State to the old road that the price of materials and the cost of construction would not decline, or that capital invested in railroads should not be subject to like vicissitudes as capital invested in other enterprises. Modern improvements and other causes have continued to reduce the cost of construction of all kinds of new plants, and to reduce the value of old plants or to render them wholly worthless, and the State did not guaranty that those causes should not in like manner affect the capital invested in railroads. Then the material question is not what the railroad cost originally, but what it would now cost to reproduce it."

But in the Minnesota Rate Cases, the State's attorneys talked "cost"; the Great Northern attorneys, "reproduction."

[1] J. F. Stevens, Record (G.N.), page 498 and following; W. L. Darling, Record (N.P.), page 117.

Nevertheless, such claims have been specifically upheld. For example, the South Dakota Board of Railroad Commissioners has said: "The railway company is entitled to any increase . . . in the price of rails, ties, or other physical item." *Twenty-First Annual Report*, page 28. In Pioneer Telephone and Telegraph Co. *v.* Westenhaver, the Oklahoma Supreme Court expressed itself as follows: "Where the market price of the physical units or of the labor entering into the construction of the plant has advanced since its construction, the original cost must be much lower than the present value; and for that reason be to the owner of the plant an unfair determination of its present value." 118 Pacific 354, 356.

[2] The language of Justice Field in the Railroad Commission Cases, where he, with Justice Harlan, dissented, and condemned the "value" test as set up in the Mississippi statute before the Court, is here interesting, as showing that an entirely different line of reasoning might have been subsequently developed by a different set of facts governing the cases, from those which came to the Court in the California Water Cases. (Above, page 8 and note 3, page 15.)

"It was certainly the expectation of the constructors of the road that

sunk, once for all. The grade, the tunnels, the concrete abutments and retaining walls, etc., can never be used except in the place where originally built. The result of this initial investment (in the great multitude of cases a permanent investment) is the large importance of the element of the return to investors in the cost of transportation. For the moment, this element may be ignored, since it is advantageous to operate the railroad which is built, even though less than the return necessary to tempt investment is secured. But, in the long run, the reward for investing, assuming risk, directing enterprise, must be met in the case of the railroad which could justify the building. Not less than this return can be "reasonable" where railroad enterprise is left to private initiative. Analyzing the problem in this light, is the "cost of reproduction" a logical basis by which to measure the "long run," — the "reasonable" return?

On the contrary, to use a figure of "cost of reproduc-

they should be allowed to receive compensation having some relation to its cost. But the act of Mississippi allows only such compensation as parties appointed by the legislature, not interested in the property, or required to possess any knowledge of the intricacies and difficulties of the business, shall determine to be a fair return on the value of the road and its appurtenances, though that may be much less than the original cost. Within the last few years, such have been the improvements in machinery, and such the decline in the cost of materials, that it is probably less expensive by one third to build and equip the road than it was when the constructors completed it. Does anybody believe that they would have undertaken the work or proceeded with it, had they been informed that notwithstanding their vast outlays, they should only be allowed, when it was finished, to receive a fair return upon its value, however much less than cost that might be?" 116 U.S. 307, 343. Justice Field very evidently thought of "value" in terms of "cost of reproduction."

Justice Harlan said to the same effect: "Does any one believe that private capitalists would have supplied the money necessary to establish and maintain these enterprises had the charters contained a provision making rates depend . . . not on the amounts expended in constructing and maintaining these roads, but on their value?" *Ibid.*, page 340. In Covington & Lexington Turnpike Co. *v.* Sandford, Justice Harlan referred to "the amount that may have been really and necessarily invested in the enterprise." 164 U.S. 578, 597.

[illegible] introduce into the standard of measurement [illegible] tor quite divorced from the business of furnishing trans- portation — the effect of [illegible] level of prices and wages. [illegible] place where the [illegible] price of the [illegible] argument [illegible] fairly treated. [illegible] drop [illegible] seven [illegible] rices [illegible] through the early nineties and continued [illegible] would have represented [illegible] to investors to insist that their [illegible] were [illegible] appreciating, [illegible] because the [illegible] production [illegible] because the reverse tendency has appeared, [illegible] appreciation [illegible] recog- nized. [illegible] conclusion [illegible] inevitable that attorneys [illegible] [illegible] these cases have been more intent upon uncertain precedents and [illegible] upon securing a valid answer [illegible] problem [illegible] which their efforts were [illegible] directed.

[illegible] cost of reproduction [illegible] to be accepted as [illegible] [illegible] stability [illegible] [illegible] adjustment [illegible] every [illegible] year [illegible] the figures must be [illegible] changes in costs. [illegible] assumed. [illegible] the writer, "that once a [illegible] been made, [illegible] kept up to date and

[illegible] similar to that here made is found in the opinion of Judge [illegible] the California Supreme Court in San Diego Water Co. [illegible] San Diego:

"[illegible] would [illegible] hardly [illegible] just to permit the consumers to avail them- selves of the idea that at the present time, similar works could be con- structed [illegible] cost [illegible] present for reducing the rates. . . . For would [illegible] on the other hand, [illegible] the consumers to require them to pay an enhanced [illegible] rates [illegible] found that it would cost more now [illegible] similar works. [illegible] contingency may well happen, not to [illegible] increased rates [illegible] reason [illegible] to allow the water com- pany [illegible] expenditures and services, [illegible] rise in the price of materials or [illegible] shall be a speculation in [illegible] company [illegible] every win or lose [illegible] fluctuations [illegible] expended for the public benefit [illegible] of seven mem- bers [illegible] Pacific 438, 1894.

available for rate cases merely by adding to it from time to time the additional investments made in the property. It is questionable if this is correct. After a valuation has been made, there may be not only additional investment, but also changes in the unit costs of labor and of materials and supplies, in the value of land. . . . It would seem therefore that if valuation is to be used for the regulation of rates, there must be complete revaluations from time to time." [1] Indeed the total secured by adding the cost of betterments to the "cost of reproduction" estimate would be devoid of real significance. Either "cost of reproduction" must be rejected, or periodic "revaluations" must be made; unless there be resignation to the use of a standard which measures neither cost nor "cost of reproduction." Only if the "valuation" purports to establish the amount of the unimpaired investment, the cost of the units in place, with deduction to measure accrued depreciation, can the subsequent figures of cost be added. Otherwise there is only a heterogeneous combination of totals made on two distinct hypotheses.[2]

[1] S. O. Dunn, "The Valuation of Railways," *Atlantic Monthly*, volume 113, page 413. See T. S. Adams, "Valuation of Railway Properties," etc., *Journal of Political Economy*, volume 23, page 16. In Mr. Dunn's argument "value" and "cost of reproduction" appear as practically equivalent terms. See also his *American Transportation Question*, chapters 5 and 6.

The following, from Director of Valuation Prouty's address before the 1914 Meeting of the National Association of Railway Commissioners, is also pertinent:

"Prices will change. Theories of valuation will change; but if you once have the quantities which enter into this inventory substantially agreed upon between the railroads and the people, you have there a basis of calculation to which you can subsequently apply different prices and different theories." *Proceedings*, 26th Annual Meeting, page 135.

[2] Yet it would seem that enthusiasm over the possibilities of "valuation" led even so keen a critic as Henry C. Adams to pass over an incongruity which is readily made apparent, when analyzed in these terms. And on this account, it is not surprising that the Commission should be found to have followed the promptings of its Statistician. See Mr. Adams' letter to former Chairman Knapp, dated May 24, 1906, quoted, *Senate Report on Valuation*, page 218, citing at length the Michigan Appraisal;

But what of the courts? Has it not been reiterated that "the thing to be ascertained is the value of the property at the time it is being used for the public service"? [1] Did not Justice Hughes declare that the property is held in private ownership, and that it is "that property and not the original cost of it, of which the owner may not be deprived"? [2] Can an "unimpaired investment" standard be reconciled with the doctrine of the courts? So long as assertion is made that "value" is not a matter of formulas, that a series of unrelated items must be considered in making a "reasonable judgment," etc., a valuation theory based upon economic principles is out of the question. The "unimpaired investment" standard is simply a reasoned attempt to meet the conditions implied by the following language of the Court in Knoxville *v.* Knoxville Water Company:

> "The company . . . is entitled to see that from the earnings the value of the property invested is kept unimpaired, so that at the end of any given terms of years, the original investment remains as it was in the beginning. It is not only the right of the company to make such a provision, but it is its duty to its bond and stockholders, and in the case of a public utility corporation, at least, its plain duty to the public." [3]

So, if the investment represents stored-up "value," unimpaired investment — the cost of the existing units minus accrued depreciation measured in dollars — represents, in a very real sense, "present value." From this viewpoint, the discussion does indicate the way to a possible reconciliation with the judicial *dicta*.

and his report to the Commission, *Statistics of Railways*, 1907, pages 147–48. See also *Annual Report*, Interstate Commerce Commission, 1910, page 37.

[1] The Valuation Brief of 1915, page 469.

[2] Minnesota Rate Cases, 230 U.S. 352, 454. It would be useless to attempt an exact interpretation of this sentence. In regulation there is no question of "[illegible]"; a measure of income is sought.

[3] 212 U

But the verdict for unimpaired investment — a cost standard — does not mean that where "the money actually paid into a railway property represents all manner of waste and extravagance, the public ought to pay on this." [1] The argument that an investment test (in terms of actual cost) would of necessity imply a guarantee (or its equivalent) upon unwise or dishonest expenditure fails to take account of the character of the rate of return as a variable.[2] Discrimination is necessary in the exceptional case in any event. No guarantee has been made by the public. None is implied. Where there are successful enterprises, there may also be failures.

[1] In the Matter of Advances (1903), 9 I.C.C. 382, 403.

[2] "If a plant is built, as probably this was, for a larger area than it finds itself able to supply, or, apart from that, if it does not, as yet, have the customers contemplated, neither justice nor the Constitution requires that, say, two thirds of the contemplated number should pay a full return. . . . If the original company embarked upon a speculation which has not turned out as expected, *more modest valuations are a result* to which it must make up its mind." Justice Holmes, San Diego L. & T. Co. *v.* Jasper, 189 U.S. 439, 446. The italics are the writer's.

To the same effect, see Stanislaus County *v.* San Joaquin and Kings River C. & I. Co., 192 U.S. 201, 214. A peculiar twist was given the reasoning by the fact that these cases concerned a statute which provided that 6 to 18 per cent should be allowed on the "value" of the property.

CHAPTER V

PHYSICAL VALUATION — UNIMPAIRED INVESTMENT

"PROPERTY INVESTMENT," the first item on the assets side of the railroad balance sheet, purports to indicate the amount of the investment which the railroad devotes to the public service. That the account is quite devoid of such significance is a matter of common knowledge. Too often, as originally set up, it has been hardly more than the journal entry necessary to balance the par value of securities. Even had the first figures been substantially accurate, conservative management, preferring to err on the side of safety, if at all, has swelled the actual investment through charges of net additions to operating expense. Or less efficient management, perhaps less honest management, or even less fortunate management, has per-

mitted the original plant to wear out, without changing the accounts.

Maintenance of the investment means something other than maintenance in a state of working efficiency. It has reference to a standard measured in dollars. That a five-year-old box car in good repair will earn as much per mile as a perfectly new box car of the same type is beside the point.[1] As between the five-year-old car and the one "perfectly new," there is this significant difference of position: if the life of such a car be twenty years "on the average," twenty-five per cent of the life is spent in the one case; nothing at all in the other. Unless, during this five years, earnings have been put back into the plant equal to the volume of income representing the using-up of the car, the investment has by so much been impaired. If the car were to be scrapped at the end of this fifth year, there would be no hesitation in recognizing that the investment was entirely gone. The principle is the same (though the task of measurement be difficult) when the item of plant is still in working condition, but with a shortened expectation of life.[2] The question always is: How much unimpaired investment — "unripened savings" — does the plant represent?

[1] J. F. Stevens, Minnesota Rate Cases, Record (G.N.), page 551; see testimony of J. J. Hill, *ibid.*, page 1330 and following. Typical of this point of view (not unusual with railroad men) are three articles by Wm. Mahl, *Railroad Gazette*, volume 43, page 418; *Railway Age Gazette*, volume 48, pages 440, 1249. Two prominent engineers, speaking at the annual meeting of the American Society of Civil Engineers, indicated their acceptance of a similar argument: W. J. Wilgus, *Proceedings*, Am. Soc., C.E., volume 40, page 366; G. F. Swain, *ibid.*, page 1413 and following. Mr. Swain took the same stand in his *New Haven Validation Report*, page 59 and following.

[2] See Allyn A. Young, "Depreciation and Rate Control," *Quarterly Journal of Economics*, volume 28, pages 634–35, for what seems to be a contrary point of view; and especially the answer by J. S. Davis, *ibid.*, volume 29, page 362. The discussion was continued in the same journal by John Bauer, volume 29, page 651, and by J. C. Bonbright, volume 30, page 546.

I

An appraisal on the basis of the cost of the units in place, with deduction to take account of accrued depreciation, seeks to determine what has in fact taken place. Unimpaired investment measured in this manner can coincide with "cost" as determined from reference to the amount of the contributions made by security-holders to the company treasury, only if the management previous to the appraisal has been successful in maintaining the "investment" at exactly the original level — the cost of improvements, etc., balancing the accrued depreciation, in terms of dollars. If the level of investment has not been kept up, or if net additions have been charged to operating expenses, there can be no such coincidence. The result of an appraisal (assuming accuracy possible) would indicate which had actually occurred.

Where, as railroad men seem so unanimous in their belief, "maintenance" has resulted in widening the grade, deepening ditches, etc., it has been insisted, even with the "cost of reproduction" hypothesis, that a creation of "capital goods," of plant, has taken place. "A railroad property is not a finished product when the construction forces have put its parts together and turned it over to the operating department. Many expenditures are still required to be made in resurfacing, in opening up clogged waterways, and in bringing about an improved condition of roadbed, right of way, and station grounds." The conspicuous item is the roadbed, where "solidification and seasoning" take place, "under the action of the elements, through use and the running of trains, through the skillful direction of labor in checking wastes on the slopes of the embankments and encouraging the growth of vegetation thereon, ditching the cuts, and kindred work." [1] Significant, of course, is the expenditure of labor in correcting

[1] The Valuation Brief of 1915, pages 157–158.

the first wastes due to the elements, and in improving the physical plant as lapse of time develops unforeseen weakness. The high cost of maintenance in the early days of operation is, in no small measure, due to the fact that such expenditures must be made. But the "appreciation" is not due to the fact that smaller maintenance charges are later necessary. It exists because amounts charged to operating expense have resulted in a net addition to the "capital goods" of the railroad.[1]

For the work of maintenance is always a creation — or a "re-creation" — of capital goods, though the accountant conceives of it only as "expense." And the reason he does not recognize that the maintenance cost represents making of plant (not *in toto* a net addition, since deduction must first be made to cover the "depreciation" which the "maintenance" seeks in part to overcome) has been the difficulty of measuring the amount of the depreciation; as well, perhaps, as the general insufficiency of practice. Adherence to the accounting categories has, it would seem, served to hide the facts which, from the point of view of economic theory, are most significant.

Take the case of the locomotive. When it has been shopped, the cost of the new wheel, or piston rod, or driving axle constitutes the existing investment, not the cost

[1] The Valuation Brief of 1915 defines "appreciation" as "in every case, an increase in value which may or may not be represented by an expenditure" (page 146). The amount of such uncertain "appreciation" is recognized as difficult of ascertainment (pages 158, 161). The methods used in the appraisals to measure the "appreciation" of the grade have been the usual bulk allowance and percentage short cuts.

The allowance for "impact and adaptation" was made by R. P. Morgan, in his *Report* to the Pacific Railway Commission (Senate Executive Document 51, 50th Congress, 1st Session, page 4454); no formal allowance was made in the Michigan or Wisconsin appraisals; but D. C. Morgan here, as in many other details, followed the precedent set by his father; Minnesota Rate Cases, Record (N.P.), pages 1863, 2037; see testimony of Howard Elliott, *ibid.*, page 1250; of W. L. Darling, *ibid.*, page 3227; and of J. F. Stevens, Record (G.N.), page 509; and Whitten, *Valuation of Public Service Corporations*, chapter XVI, page 310.

of the original part which has become worn out and useless for productive purposes. The Superintendent of Motive Power of the Great Northern cited, in the Minnesota Rate Cases, the instance of an engine, purchased "say thirty-seven years" before, which was still in service, though possibly not ten per cent of the original locomotive remained intact. "A limit" was placed "for all working parts — all reciprocating, revolving, and frictional parts"; and when the parts reached "this certain limit," they were renewed. "The same thing" held true "in connection with a boiler," and with parts of cars.[1] The accountant would conceive of the cost of such repairs as "maintenance," therefore solely as "operating expenses."[2] Business practice does not coincide with the refinement of economic theory, which is important for the course of the present reasoning.

Former Commissioner Maltbie, of New York, has indicated his adherence to a position opposed to that here contended for:

> "If a company has included in its operating expenses, items which it now asserts are part of its capital investment, it is in error. An expenditure cannot be an operating expense one day and a capital charge another according to the thesis which the company at that moment is attempting to maintain. Certainly if it has included an item among operating expenses, it is incumbent upon the company to show wherein such act was wrong, and why the Commission should in any rate case be compelled to allow it a return upon property paid for out of operating expenses. . . ."

Mr. Maltbie illustrated his meaning:

> "In the case of a car which originally did not have air brakes, but has been equipped with modern appliances, cost to date means the original cost of the car plus the cost of the

[1] G. H. Emerson, Minnesota Rate Cases, Record (G.N.), page 953.

[2] But see the suggestive diagrams, in F. A. Delano, "The Application of a Depreciation Charge in Railway Accounting," *Journal of Political Economy*, volume 16, page 585 and following.

air brakes; but it does not include the cost of replacing the old equipment with new equipment of the same character, or of new equipment slightly different in form, but not increasing the carrying capacity or durability of the car."

It would seem that this language fails to meet the important issue. Car capacity, efficiency, etc., are beside the point. Investment — unimpaired investment — alone is significant. To illustrate; assume that a car costing $800 is equipped with air brakes at a cost of $35. Later the air brake equipment is replaced *in toto* at a cost of $60, the extra $25 being charged to operating expenses. Mr. Maltbie would place the "cost to date" at $835; the present reasoning (leaving aside the question of depreciation) would set the investment at $860. The accounting practice would have nothing to do with the fundamental issue.[1]

The validity of the present contention is seen most clearly, perhaps, when the old property has been totally destroyed. An excellent illustration is afforded by the flood damage which was suffered by the Ohio and Indiana lines in 1913. The old station houses, grade, bridges, track, etc., were practically wiped out. The cost of the roadbed and structures which were built in repairing the damage was charged to operating expense in that year. But the accounting practice does not hide the fact that the cost in 1913 — the cost of replacing destroyed units — constitutes the investment in existing plant, subject to changes from depreciation and "maintenance." The original roadbed and the structures built thirty or fifty years ago were destroyed by the flood. Their cost, therefore, has nothing whatever to do with the existing units of

[1] This discussion is based upon Mr. Maltbie's Report to the National Association of Railway Commissioners, *Proceedings*, 26th Annual Meeting, page 183. In apparent accord with him are John H. Gray, "The Vagaries of Valuation," *American Economic Review*, volume 4, Supplement, page 32; and E. W. Bemis, *Proceedings*, National Association of Railway Commissioners, 25th Annual Meeting, page 318.

railroad plant.[1] If the destruction was only partial, some units of the original plant and some of the new now exist side by side. Investment has been made at separate dates.

One cannot be sure that the Interstate Commerce Commission has conclusively disposed of the policy of charging plant to operating expense. In the absence of depreciation charges, or when charges based upon an expected life of fifty to a hundred years have been made on equipment which will probably last less than thirty,[2] the fact that extensions or realignments have been paid for out of earnings does not *of itself* prove that net additions to investment have been made. In Central Yellow Pine Association *v.* Illinois Central Railroad Company,[3] an advance in rates was justified by the carriers on the plea that their net returns were insufficient, due to increased cost of operation. Commissioner Clements found that considerable sums spent for new equipment and for improvements to roadbed had been charged to operating expenses. These items were held to be improperly charged in this manner, since "the shipper of to-day could not be properly required to pay the entire cost of an improvement or addition which was to be of permanent use." [4] Suit was brought to enforce the order of the Commission that the roads desist from making the advance, and the Supreme Court sustained the order. "It would seem," said Justice McKenna, "as if expenditures

[1] The unusually high "maintenance" charges due to flood damage were discussed in the Five Per Cent Case, 31 I.C.C. 350, 371.

An example of property destroyed in war times (the Atlanta & West Point), and subsequently "rebuilt" from earnings, was cited by Commissioner Clements in his testimony before the House Committee on Interstate Commerce, in 1912. *Senate Report on Valuation*, page 206.

[2] See St. Paul and Puget Sound Accounts, 29 I.C.C. 508, 515.

[3] 10 I.C.C. 505.

[4] Eastern Advance Case of 1910, 20 I.C.C. 243, 265. See Cattle Raisers' Association *v.* M.K. & T. Ry. Co., 13 I.C.C. 418, 432; Receivers and Shippers Association *v.* C.N.O. & T.P. Ry. Co., 18 I.C.C. 440, 462.

for additions to construction and equipment, as expenditures for original construction and equipment, should be reimbursed by all the traffic they accommodate during the period of their duration, and that improvements that will last many years should not be charged against the revenues of a single year." [1] This argument fails to recognize that the income spent for fixed improvement *may* be that which is received in reimbursement for the wearing out of fixed capital where investment has been made in the past. Unless "instrumentalities which are to be used for years" are paid for "by the revenues of a single day or year," the investment cannot be kept intact. The same principle is involved whether replacement in kind is effected or additional units of plant are added. Both represent expenditures made for a future day. But it is only if the amount of the maintenance cost in any one year, plus the amount spent for new plant, exceeds the accruing depreciation that there is any net addition to the investment in plant. The Commission may well have reached a correct answer in the Central Yellow Pine Case, but the argument used to justify that answer is not necessarily convincing. It would seem that the Commission itself forgot that maintenance in a state of efficiency does not necessarily signify maintenance of the volume of investment in terms of dollars.

The possible inadequacy of the charges to operating expenses where no depreciation reserve has been established, or where an improbable lifetime has been assumed for equipment, directs attention to the railroad "surplus" accounts. If, in the past, net earnings have been actually overstated through failure to charge the amount necessary

[1] Illinois Central R.R. Co. *v.* I.C.C., 206 U.S. 441, 462. The Commission's holding in the Central Yellow Pine Case and the Supreme Court's approval of the doctrine are the basis for Commissioner Prouty's argument refusing to permit earnings which should pay for the "unproductive improvements." Eastern Advance Case of 1910, 20 I.C.C. 243, 265.

to take account of the depreciation — either through neglect or maintenance, or failure to set up a reserve, or both — any addition to surplus in that year has by so much been unreal. On the other hand, when net additions to "investment" have been made through charges to operating expenses (in substance, where a "secret reserve" has been created) the surplus has been understated. In view of the haphazard mode of handling railroad accounts, therefore, the fact that a "surplus" account is carried on the books of itself signifies nothing.[1]

This fact, too, it would seem, the Commission has overlooked. Neither in the Spokane Case, nor in the 1910 Advance Cases, was challenge directed at the reality of the surplus. The nearest approach to a searching criticism is Commissioner Lane's assertion that the surplus depends "upon the nature of a railroad's capitalization, the policy of the road with respect to charges for maintenance, the volume of the dividend, and other factors entirely within

[1] Commissioner Prouty, discussing the railroad claim "that there is an item of obsolescence in the development of a railroad which should be recognized in the surplus," approached a statement of this problem, but that is all. He assumed the case of the building of a railroad over a mountain, "it being more economical to haul the traffic up and down the steep grades than to incur the great outlay which would be required by constructing a tunnel. With the development of traffic the time comes when this mountain must be pierced, and a tunnel is accordingly constructed at a large expenditure. . . .

"Now, it had been certain from the day of the original construction of that railroad that in time the tunnel must be built. Each year the day drew nearer when the line over that mountain would no longer be used, and therefore each year subtracted from the value of that line. It may well be said that the railroad should be allowed to accumulate a fund out of its revenues from operation against the time when this piece of railroad must be entirely thrown away. Under our present system of accounting railways are required to make a depreciation charge with respect to their equipment for the purpose of providing against contingencies of this sort; but they make no such charges with respect to their way and structures, and it seems proper that the accumulation of a surplus should be allowed in this view." The Eastern Advance Case of 1910, 20 I.C.C. 243, 271. See testimony of President Ripley of the Santa Fé, Evidence, 1910 Advances, page 24.

the directors' control." The lines of inquiry possibly suggested by these topics were not opened.[1]

II

Failure to understand the nature of the depreciation reserve, and the purpose of making the annual charge to depreciation, has led to further confusion. Depreciation is a necessary operating cost, whether or not it is given formal recognition in the accounts. The formal allowance simply seeks to insure that, when any unit of plant is retired, its cost shall have been charged against the expense of producing the commodity or service to which it has contributed during its working lifetime. In this sense, necessity for replacement may be said to account for the insistence upon the charge to depreciation. "Capital goods" wear out. But the reserve, created through a series of annual charges as plant nears the day of scrapping, and the investment "ripens" into product, is in no sense of the word a "fund" for the provision of new units of plant.[2] The total accumu-

[1] The Western Advance Case of 1910, 20 I.C.C. 307, 332. See the Eastern Case, page 269, summarizing the testimony of President McCrea, of the Pennsylvania, who had said that since 1887 the amount expended on the property of the lines east of Pittsburgh out of surplus earnings and from other sources than the proceeds of the sale of securities had aggregated $262,000,000, the largest amount being provided by surplus earnings. Evidence, 1910 Advances, page 2287; also page 2315; see testimony of W. C. Brown, of the New York Central Lines, page 2489; of Frank Ward, of the C.B. & Q., page 1014; and of M. P. Blauvelt, of the Illinois Central, pages 507, 530. But at no point did a challenge appear to indicate the inconclusive nature of this testimony. To what extent, if at all, does the addition of property costing some $262,000,000 represent a net addition to investment (not to physical units of plant)? — That is the significant point for the economist. But this difficulty, the Commission, and its attorney, Mr. Lyon, did not consider. See Brief of the latter, Evidence, 1910 Advances, page 3527.

[2] In Railroad Commission of Louisiana *v.* Cumberland T. & T. Co., Justice Peckham apparently failed to see the real significance of the depreciation reserve. In the lower court the counsel for the Louisiana Commission had argued that a part of the company's plant had been paid for out of earnings, "the surplus or reserve or depreciation fund, which was

lation at any one time (assuming the accounting records to measure, with all practicable accuracy, the real economic facts) measures the amount by which the investment has been used up. The usual practice of diminishing the reserve through a series of journal entries, as new units of equipment are added, does not mean that the depreciation reserve is established in order to provide a fund for replacements. That many accountants, including even those of the Interstate Commerce Commission, may have been guilty of this confusion, does not in any sense alter the fundamental problem of economics.[1]

accumulated by the complainant from the receipts . . . and was then invested, not in repairs and maintenance, but in extensions and property." To this theory (which looks upon the depreciation reserve as a source for repairs and maintenance, and not as a measure of accrued depreciation) Justice Peckham subscribed.

"It was obligatory upon the complainant," he said, in reversing the opinion of the lower court, "to show that no part of the money raised to pay for depreciation was added to capital, upon which a return was to be made to stockholders in the way of dividends for the future. . . . It certainly was not proper for the complainant to take the money, or any portion of it, which it received as a result of the rates under which it was operating, and so to use it, or any part of it, as to permit the company to add it to its capital account, upon which it was paying dividends to shareholders. If that were allowable, it would be collecting money to pay for depreciation of the property and, having collected it, to use it in another way, upon which the complainant would obtain a return and distribute it to its stockholders. That it was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind, and so it might accumulate; but to raise more than money enough for the purpose, and place the balance to the credit of capital upon which to pay dividends, cannot be proper treatment." 212 U.S. 414, 424. For similarly uncertain language, see quotations from cases given in the Valuation Brief of 1915, pages 167–88.

The elusive character of the depreciation reserve, as contrasted with the depreciation fund, has also, as it seems to the writer, deceived J. E. Allison, *Should Public Service Properties be Depreciated?* etc., though Mr. Allison's conclusions are diametrically opposed to those of Justice Peckham (pages 17, 26).

[1] For what seems to be a contrary conclusion, see Professor Young's "Concluding Comments" on Dr. Davis' criticism of Professor Young's article in the *Quarterly Journal of Economics*, volume 28, page 630; vol-

As a matter of fact, in a business possessing a large and varied plant, the "depreciation reserve" is usually permanent. The plant is maintained in a state of "average depreciation." Some writers, looking upon this phenomenon alone, as it would seem, and thinking of the cause of establishing the reserve as the creation of a source of replacements, and not as a measure of used-up investment (used-up "savings") have thereupon emphasized the "uselessness" of the "depreciation reserve." [1] The proposed application of this conception is most easily given in the words of Professor Allyn A. Young. His conclusions, and their bearing on the problem of measuring reasonableness, are thus summarized:

> "1. The absence of such a reserve does not *necessarily* mean that part of the principal of the investment has been returned to the proprietors.
>
> "2. In valuation for purposes of rate control no deduction should be made on account of the depreciation of large and varied properties, except for depreciation allocated to a period in which depreciation accruals were regularly charged to operating expenses." [2]

In the case of the railroads this would generally mean deduction for accrued depreciation of rolling stock accruing since 1908. All other items of inventory (and equipment, prior to 1908), rails, ties, fences (whether nearly new, half worn out or ready for the scrap heap), should be appraised as though new. The proposal, to say the least, is startling.

ume 29, pages 395–96. The present writer finds Dr. Davis' argument conclusive. See the Valuation Brief of 1915, page 240 and following.

[1] This concept of the "useless" depreciation reserve apparently originated with J. E. Allison. See the Valuation Brief of 1915, page 196, where counsel say, "Such funds serve the purpose of disclosing and analyzing operating costs."

[2] *Quarterly Journal of Economics*, volume 28, page 663. A third conclusion, which need not here be considered, is: "If depreciation charges have not been required by public authority, it cannot be assumed that the proprietors of a large public service undertaking should have accumulated a reserve for accrued depreciation."

The basis for these conclusions is the insistence that deduction for accrued depreciation in the absence of reserves is a regulation of "past profits." Professor Young's argument is, briefly, that the "expectations, plans, and estimates" of "proprietors" did not take into account accruing depreciation as a cost of operation, since the reserve would have been a permanent account, and therefore "useless" as a source of replacements. The failure to charge depreciation increased the "profits" which the company apparently had earned. It was therefore entitled (or thought itself entitled) to declare this amount in dividends. To deduct now for the accrued depreciation would scale down the investment which was being "maintained" in a state of working efficiency.

So long as Professor Young attempts to uphold this contention by economic reasoning, he seems on dangerous ground. The omission of the charge against the inevitable wasting of capital goods serves, it is true, to swell *nominal* profits. But to insist that these nominal profits represent real net income (as he and Mr. Allison appear to do) is to close one's eyes to the nature of "business profits." Profits cannot be defined in terms of the "expectations, plans, and estimates" of proprietors. They are the residual share of income after all expenses of production (and the cost of the plant which has "ripened" into a commodity or a service is a very real part of this cost) have been deducted from gross income. Some one may have been deceived into thinking that profits were greater than in fact they were. He may even have deceived himself. But the using up of machinery goes on quite apart from expectation or opinion. To omit a charge for depreciation may exaggerate the amount of profit; but the real net income does not accrue until total cost is met. To deduct for accrued depreciation cannot therefore represent a regulation of "past profits." On economic principles the failure to deduct for accrued depreciation cannot be justified.

Nor does the absence of the formal reserve mean that the investment may not have been kept intact, even increased. It is possible to accept the first of Professor Young's conclusions as quoted without accepting his argument. The reason why there may have been no return of a part of the investment to the proprietors does not lie in the fact that a reserve would be a permanent account, and hence "useless" for replacement purposes. The reason lies in the fact that though depreciation reserves have not been set up, the investment, especially in the case of the railroads, has frequently been kept up through "money put back into the property."[1] In an entirely haphazard manner the level of "unimpaired savings" embodied in the plant may even have been increased, though a state of working efficiency (ability to turn out ton-miles in a given period) has, it would seem, been the ideal actually sought. And it is because of this practice that the failure to establish a depreciation reserve has not *necessarily* meant a return of investment to the owners, or its wasting, with the realization of a business risk.

When the argument is put upon considerations of protecting "innocent holders," of protecting "vested interests," rather than upon those of economic principles, there is perhaps more to be said for Professor Young's contention. The difficulty presented in these terms is always a real one. Professor Young would say that had these "proprietors" conceived of depreciation as a "cost" regularly accruing, rates might have been higher. In the case of railroad rates, such consequences of a lack of charges to depreciation may probably be discounted. Rate wars and treaties account for the schedules main-

[1] See Illinois Central R.R. Co. *v.* I.C.C., 206 U.S. 441, 462, where making improvements out of earnings was cited by the railroad as an "axiom." The argument of Walker D. Hines, in the 1910 Advance Cases (Evidence, page 5290), is also here pertinent.

tained, and, whatever the accounting tradition of the day, competition must have been the force most effective in determining the general level of rates.

But frank recognition of the actual economic situation (*the depreciation of the plant*) does not prevent attending to an "ethical" element; and upon logical, not artificial, premises. That there is a difficulty which is not to be swept aside by a formula may be granted. The presence of a depreciation reserve or its absence is not, however, the important economic issue. The present reasoning points clearly enough that, unless the amount of the unimpaired investment is to be overstated, the deduction for accrued depreciation must be made. If any allowance shall be granted to "vested interests," based on expectations, and a definition of "profits," which are not "profits" at all, it can be made in the rate of return calculated on the depreciated "value." The deviation from the normal policy can in this way consciously focus on the abnormal case without the danger of setting up an illogical precedent.

The confusion involved in the assumption that the "depreciation allowance, wherever made, is for the purpose of accumulating a fund with which to cover the cost of replacements," [1] accounts for a denial that existing plant is depreciated so long as replacements and repairs are made as needed and charged to operating expenses — the policy of the railroads prior to the accounting amendment of the Interstate Commerce Act in 1906. An obvious distinction has been drawn between a "composite" and a "simple" property:

> "A simple property may be defined as one which cannot be economically renewed piecemeal, but must be renewed as a whole. A composite property may be defined as one composed of two or more simple properties, which simple properties can be renewed independently. A railroad property may be described as a composite property made up of

[1] The Valuation Brief of 1915, page 166.

> a great number of simple properties of varying ages and conditions of usefulness. Examples of a simple property are a tie, a rail, a wheel. Examples of a composite property are a car, a locomotive, the track, i.e., composed of rails, ties, ballast, fastenings, etc., and the railroad." [1]

What is the attempted application of these definitions? There is no denial that the simple properties deteriorate from age and use. But "while physical deterioration in a simple property, whereby the service life of that property is shortened, is *depreciation* in it, such *physical deterioration* in the simple properties composing a railroad does not at all necessarily mean that the railroad as a whole is depreciated." [2] And why? Take the case of the track:

> "The track must be, and is, indefinitely maintained, and never comes to the end of its service life, and never requires replacement as a unit. Not coming to the end of its service life, depreciation due to a loss of service life does not exist in the track . . . the accrued depreciation in these parts (ties, rails, fixtures, etc.) is not depreciation of the track. The track itself cannot be depreciated unless repairs and replacements on it are neglected." [3]

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[1] The Valuation Brief of 1915, page 162.

[2] *Ibid.*, page 166.

[3] *Ibid.*, pages 231 and 234. At page 237, counsel continue in terms which indicate a failure, or an unwillingness, for strategic reasons, to recognize the lack of logic in their concept of depreciation:

"To deduct . . . the accrued depreciation in the ties, rails, etc., . . . would lead to the absurdity of finding that the same class of tie, of the same age, costing the same money in place, is worth more in one road than in the other, because its service is longer in the one road than in the other. The life of the same character of tie will vary on different roads due to the difference in use. Assuming that the life of such a tie is six years on one road, and nine years on another road, and that it has been in place three years on each road, it will be found that it has three years of life remaining on one road, or 50 per cent of its value new, and six years of life on the other road, or 66⅔ per cent of its value new; all of which shows that the length of service life of the various units composing the track is not a factor in determining the value of the track, but is only a factor in determining its cost of maintenance. The only service life that is involved in depreciation is the service life of the track, and this life being continuous and indefinite, depreciation due to service life is not to be considered."

The answer to this train of discussion can be briefly summarized. The argument not only assumes that the whole can be something more than the sum of its parts, but it harks back to the error of assuming that maintenance in a state of working efficiency is maintenance of the investment. Investment is made in terms of dollars, and can only be measured in terms of dollars, and the maintenance of the investment is only attained through "putting earnings back into the property" equal to the amount of the original investment in capital goods used up in furnishing current services. The railroad argument fails to recognize the place of capital goods in the productive process.

III

And what of the indestructible item in the inventory — the railroad site — land? Consideration must pass to the assumption that the railroad is entitled to a "reasonable share" — whatever that may be interpreted to mean — "in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value." [1] If the "adjacent land test" and the "similar" land test, as proposed in the Minnesota decision, be barred on logical grounds, what expedient is left? The argument turns at each step to original cost, to investment.

Original cost, applied to land, would, *prima facie*, seem to deny the possibility of an "unearned increment." It has therefore been attacked on three grounds:

> I. "As the company may not be protected in its actual investment, if the value be plainly less, so the making of a just return for the use of property involves the recognition of its fair value, if it be more than its cost." [2]

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[1] Minnesota Rate Cases, 230 U.S. 352, 455. Justice Hughes merely said, "assuming that the company is entitled," etc. He did not say that the company *is* entitled, etc. See discussion, above, page 91.

[2] Justice Hughes, Minnesota Rate Cases, 230 U.S. 352, 454.

II. "Inasmuch as the land is used in serving the public; and if not so used could be realized upon by the company at its present value, it seems only fair that this present value should be the basis for estimating the amount of return. . . . This appreciated value is in the nature of a profit invested for the public." [1]

III. "Not to permit owners of the railroads . . . to get any benefit from the unearned increment is to place this class in the community at a disadvantage as compared with other classes." [2]

The question, it should be emphasized, is not whether the railroads should be permitted to receive the benefit of the increased value of land which is to be taken from the railroad service and devoted to another entirely different purpose: as, for example, when the building of a union terminal causes several railroads to place the sites of abandoned stations upon the market.[3] In such a case as this, the land is no longer railroad land. It is business land, and its value is dependent upon the capitalized site rent which it will command for business purposes. When the railroad made its purchase years ago it withdrew the land from business use. Now after a period in railroad service the land is to be returned to commercial or industrial use. In the mean time the community has built up, and a site perhaps originally costing only a few hundred dollars can be sold for thousands. An "unearned incre-

[1] *Report* of the St. Louis Public Service Commission, on Rates of Union Electric Light and Power Co. (1911), page 33.

[2] W. H. Lyon, *Capitalization*, page 236.

[3] The following testimony of J. J. Hill, Minnesota Rate Cases, Record (G.N.), page 1345, passes over this fact: "I think that a railroad going into a new country and building it up and furnishing the facilities to open it up and doing all their share of the work, is entitled even to more consideration than the man who went out and bought the land and let it lay and did nothing whatever. If the land went from $1.50 an acre to $3.00 or $5.00, or from $10.00 up to $25.00 or $30.00, as in many cases it has in this State, nobody would challenge his right to sell it at a profit; I don't know why the railroad should not have the same advantage, because they have done something in making it possible for people to live where they could not live before."

ment" thereby arises, and it arises because the amount of the "economic rent" which that site will command has increased over that of the day when the railroad made its purchase. In such a case, while the public permits the private individual to profit by the increase in value, there appears no reason even to question the parallel right of the railroad. But this is not the fundamental issue now under discussion, however much it may have been confused with that issue.

Undoubtedly the first argument cited, that based upon "give and take," upon consistency, has appealed most strongly to the judicial mind. The public does not underwrite losses; therefore any "unearned increment" should accrue to the company. This conclusion has been assumed as axiomatic. In no case has a reasoned explanation appeared. It would appear, in fact, that the argument was used first to justify, not an appreciated "value," but one below the amount of the original cost. Here, then, the premises were reversed, from those assumed to apply to the railroad; where, indeed, it could be only in the most exceptional case that an "unearned increment" would not appear, using the "adjacent land" test. The effect of the coming of the railroad is to increase at once the value of the land in the tributary territory. But, in the case of "land depreciation," it was decided that not cost but "value" should govern; the argument in the lower court being that, if the land became more valuable, the company was "justly entitled to the benefit of the increased value"; therefore "those who invested their money in it and took the chance of an increase in value, should bear the burden of the decrease." [1] When, the "value" test accepted by the Supreme Court, the land owned by the company whose

[1] San Diego L. & T. Co. *v.* National City, 74 Fed. 79, 83; see Same *v.* Jasper, 110 Fed. 702, 714. It must be remembered that these cases arose under a California statute establishing a "value" test.

rates were being considered showed an increase in value (according to the evidence), the argument was soon turned around. The San Diego Land and Town Company had asked that the original cost be considered, since, with the collapse of the boom in Southern California, the "value" was less.[1] In the railroad cases, as in the local utility cases, where the sites occupied by plants have been surrounded by business blocks, etc., and an "appreciation" has been claimed, the representatives of the public have insisted upon cost, and those of the private interests have talked of "present value."[2]

The Supreme Court has, therefore, had occasion to pass upon the issue. In the New York Gas Case the land used by the Consolidated Gas Company had been "valued" by Judge Hough as general business property, and the "unearned increment" allowed over the protest of the attorneys in opposition. Justice Peckham, passing upon this question, announced the doctrine that "if the property which legally enters into the consideration of the question

[1] Brief of J. D. Works for the Company, 174 U.S. 739 (National City Case); and 189 U.S. 439 (Jasper Case). The Wisconsin Commission in the Superior Case (10 W.R.C.R. 704, 739) also used a "depreciated" value for land bought in "boom" times.

[2] See Brief of Alton B. Parker, Willcox *v.* Consolidated Gas Co., 212 U.S. 19.

In opposition it was alleged that the plea for the cost basis in "valuing" land was, "in its last analysis, pure socialism." Brief of James M. Beck for the Company, page 98. Mr. Beck also called the proposal one "for the legislative equalization of fortunes," which "if addressed to a Single Tax Society," etc. He even invited "the earnest consideration" of the Court to the "irreparable damage which would be done to investments in this country, if the doctrine for which the appellant contended" were sanctioned. "Billions of dollars are invested in railroad properties, and there is insistent public demand for a revaluation of railroad properties as the basis of determining the reasonableness of their charges. Most of these railroads have been built for many years, and some, like the Baltimore and Ohio, for nearly three quarters of a century. Many of them occupy a part of their original road-beds, and still use in part their original terminal facilities. If these are to be valued on a basis of their original cost, there will be a destruction of values which may justly be compared to the San Francisco earthquake." *Ibid.*, page 103.

of rates has increased in value since it was acquired, the company is entitled to the benefit of such increase. That is at least the general rule." Then, lest he might seem to have committed the Court in too positive terms, he continued, "We do not say that there may not possibly be an exception to it, where the property may have increased so enormously in value as to render a rate permitting a reasonable return upon such increased value, unjust to the public." [1] And in these words, it is clear, Justice Peckham begged the whole question.

In the Minnesota Rate Cases, there is the language of Justice Hughes in part already quoted:

> "It is clear that in ascertaining the present value we are not limited to the consideration of the amount of the actual investment. If that has been reckless or improvident, losses may be sustained which the community does not underwrite. As the company may not be protected in its actual investment, if the value of its property be plainly less, so the making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost. The property is held in private ownership and it is that property, and not the original cost of it, of which the owner may not be deprived, without due process of law." [2]

The validity of this argument necessarily depends upon the validity of the premises upon which it is based. Should

[1] Willcox *v.* Consolidated Gas Co., 212 U.S. 19, 52.

In Appleton *v.* Appleton Water Works Co., the Wisconsin Commission said: "If real estate has enhanced to such an extent that a return upon its value [determined on sales method] would be in excess of the reasonable value of the use for the purpose to which it is devoted, the excess value should be treated as surplus, and not as a part of the investment." 5 W.R.C.R. 215, 224.

[2] Minnesota Rate Cases, 230 U.S. 352, 454. See Cotting *v.* Kansas City S.Y. Co., 82 Fed. 850, 854, and Brief of C. M. Dawes for the C.B. & Q., Evidence, 1910 Advances, page 3634.

In Reagan *v.* Farmers' Loan & Trust Co., Justice Brewer, speaking of a circumstance when "cost" might not govern, said: "The construction may have been at a time when material and labor were at the highest price, so that the actual cost far exceeds the present value." 154 U.S. 362, 412.

not the company be protected in its actual investment? Take the case of a railroad which buys land and builds a plant to furnish transportation. The inducement for buying the land is the expectation that, over and above the interest on the plant itself, — over and above any return ascribable as profits, etc., — the going rate of return will be earned upon the cost of the site. Without the expectation of earning this amount, the investment will not be made. From this point of view, a return upon the *original cost* of the real estate is seen as a necessary part of the long-run cost of furnishing transportation. At least this amount must be allowed in order to induce private individuals to furnish funds for construction. The "give-and-take" argument fails to meet this significant issue. The basic premise is invalid.

Pass, therefore, to the second argument for the allowance of an "unearned increment." The following from *The New Haven Validation Report* presents the essential steps:

> "If an individual or a corporation buys a piece of property, the investment is not the price of it, but the property itself. If the property appreciates in value, the concern should legitimately expect and be allowed to earn a proper income upon its appreciated value. If it is not able or allowed to do this, it would naturally sell the property for its increased value, and put the money into something which would bring the proper income upon that value." [1]

This language, like most reasoning upon economic subjects which insists upon the "naturalness" of a result, does not constitute adequate analysis. What is here portrayed as a "natural" phenomenon would be a most "unnatural" one. And this is because the permanent way represents a

[1] Page 61. The same misunderstanding of what constitutes "investment" is found in Consolidated Gas Co. *v.* New York, 157 Fed. 849, 856. Investment, however, refers to the amount of "savings" which are put into the purchase of a given site, to *cost*. Investment can only increase with added expenditure; an "unearned increment" in land value means an increase in value, without an increase in investment. Why else "unearned"?

large fixed investment, which would be lost with the abandonment of any portion of the right of way. If the railroad were to discontinue operations (and this would constitute an acknowledgment that the investment in plant was lost anyway), the land could be sold. But where operations are to be continued, where the amounts spent in grading, tracklaying, etc., are not given up as lost for all time, one can be very skeptical of the "naturalness" of the railroad policy which would abandon an existing line in order to buy land at a higher price. All of the advantages which the original line possesses — favorable operating conditions, track connections, convenient station locations, etc. — would hardly be abandoned through any semi-automatic process. What would the railroad gain? The new site is costly, buildings must be wrecked, grading expense must be incurred, etc. And all the differential advantages possessed by the old site are lost. It indeed seems difficult to believe that such fanciful reasoning should have had serious consideration.

The third argument for allowance of an unearned increment, "that the owners of railroad property are entitled to any increase in the value of their property that may accrue from the progress of the territory in which it lies, and that they have as much right to the natural increments in the physical value of their property as the owners of any other property," [1] raises an issue distinctly involving broad questions of public policy. With these, however, the present discussion is not concerned.[2] Here it is sufficient to indicate that a logical discussion cannot

[1] Buell *v.* C.M. & St.P. Ry. Co., 1 W.R.C.R. 324, 479. In State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 579, the Wisconsin Commission spoke of rents increasing with the "natural increase in the value of the land," etc. See San Diego L. & T. Co. *v.* National City, 74 Fed. 79, 83; and L. & N. R.R. Co. *v.* R.R. Commission of Alabama, "intrinsic worth" of the land, 196 Fed. 800, 822; Consolidated Gas Co. *v.* New York, 157 Fed. 849, 855.

[2] See the discussion below, page 203.

be maintained from the point of view of "fair value." Before an "unearned increment" in land values can ever appear, there must be (other things remaining the same) an increase in the "economic rent" accruing upon that land. Under these circumstances an increase in the annual income which can be earned upon the site means an increase in its value. Now the moment that railroad *income* extends beyond the point necessary to reward the skill and judgment exercised in its building, an "unearned increment" appears. But how large this "unearned increment" shall be necessarily depends upon the level of rates.

But if there cannot be any "unearned increment" in railroad land, apart from one dependent upon earnings, and consequently dependent upon rates, — the adjacent land test in its various phases being rejected — the original cost would still seem to constitute the only available test of reasonableness. Original cost measures investment. The amount of any "unearned increment" must be allowed for in the rate of return.

Immediately, however, another difficulty appears: What of the lands which cost the railroad nothing? This question, though urged upon Justice Hughes, was not considered in his opinion, since "defects" in the proof made it unnecessary to pass upon the further point.[1] Unwarranted dependence upon the analogy between condemnation and regulation, and upon the rule governing condemnation that "no inquiry is permitted as to how the owners have acquired the property, provided only it be legally held by them," [2] has led to the conclusion that the value of

[1] Minnesota Rate Cases, 230 U.S. 352, 456.

[2] Ames *v.* Union Pacific, 64 Fed. 165, 176. Justice Brewer also declared, "No inquiry is open as to whether the owner has received gifts." See Minnesota Rate Cases, Record (N.P.), pages 428–36; also Evidence, 1910 Advances, Brief of C. M. Dawes for the C.B. & Q., page 3634; and that of Messrs. Hanson and Ellis for the C.M. & St.P., page 4062.

donated land is "just as much to be considered for rate purposes as is the value of any other property devoted by the railway company to the use of the public." "Where property is given to a railway for a right of way, such property becomes as much a part of the property of the railway company . . . as property purchased. . . ." Indeed, it is "necessary not to be misled by the fact either that the railroad company on its original acquirement gave too much or nothing for the property." [1] In short, the problem is simply one in the determination of "present value." [2]

Indeed, since Justice Hughes left the issue until such time as it is necessarily raised, the inclusion of donated property must be conceded as the practice approved in the lower courts. Judge Hough in the New York Gas Case even made, not title, but occupancy, the test. To him it was conclusive that if the company were not occupying certain streets, "it would have been occupying lands of substantially similar value in the vicinity of its plants." [3] The Master in the Minnesota Rate Cases also argued that, in case of reproduction, public streets "would cost practically as much as private property." [4] But in general these subtleties have not been indulged in by the attorneys for the railroad companies. Instead they have seized on the bigger question of the status of the right of way and terminal lands which were granted by the Government to the railroads at the time of construction. Quite worthless then, the lands are, it is insisted, "valuable" now, when the

[1] Report of W. S. Thorington, Special Master, Central of Georgia Case, page 121; Report, Western Railway of Alabama Case, page 65.

[2] Western Railway of Alabama *v.* R.R. Commission of Alabama, 197 Fed. 954, 959. Mr. Thorington did express some skepticism of the validity of using multiples, but included them on the authority of the decision of the lower court in the Minnesota Rate Cases. See his Report in the Central of Georgia Case, pages 122–23.

[3] Consolidated Gas Co. *v.* New York, 157 Fed. 849, 858.

[4] Report of Chas. E. Otis, page 224. See Shepherd *v.* N.P. Ry. Co., 184 Fed. 765, 803.

tributary territory is populated, when cities and towns have grown up. The Spokane terminals which the Northern Pacific "valued" (by the "adjacent land" and "multiple" test) at $7,000,000, and which had in large measure been donated, serve to illustrate the situation. But along the entire line of the donated right of way, the same phenomenon exists. Adjacent land is more valuable.

This, of course, brings up the old question of measurement. Let it be granted that the donated right of way "belongs to the donee in the same fullness as if it had been paid for." [1] How fix upon a "value"? The "adjacent land" test, with which, it would seem, dependence on "railroad intuition" [2] has in such large measure been combined, is fallacious. To value railroad land as other land is valued, by the capitalization of the "economic rent," means vicious reasoning. Only the use of original cost can eliminate the fallacies. Does this mean that, the cost being nothing at all, the donated land is to be eliminated from consideration by virtue of the nature of the economic problem which the test of reasonableness seeks to solve? Yes, subject to only one possible qualification: it would not be contrary to economic reasoning to include the lands at their value at the time they were donated to the railroad. But this would constitute small comfort to the railroad which built across public lands which, in the absence of transportation facilities, it was not worth while to cultivate.

Nor does either programme mean injustice to the railroad investor. The donation of right of way was made in order to render attractive the investment of funds in grading, structures, and equipment. A part of the usual expense attendant in building was saved, since it was unnecessary for the road to make expenditure for the land

[1] Brief of C. M. Dawes for the C.B. & Q., Evidence, 1910 Advances, page 3634.

[2] Testimony of W. L. Park, of the Illinois Central, *ibid.*, page 605.

needed for its service. The same earnings would mean a larger rate of return on the smaller investment. And, at the same time, the road receiving the free right of way secured a differential advantage over any subsequently constructed competitor which would be forced to buy its right of way and terminal sites, at prices representing the capitalization of an economic rent dependent on the presence of the first road. The building of the Great Northern, or more recently of the Chicago, Milwaukee and St. Paul, competing with the pioneer Northern Pacific, is here a case in point. The St. Paul met the rates set by the pioneer lines, but its fixed charges include a payment of interest upon purchases of lands which the Northern Pacific was in large measure spared.

And this differential advantage, possessed by the Northern Pacific, is one necessarily permanent. The traffic now exists in sufficient volume to have tempted the building of a new transcontinental railroad. But at the time the land-grant roads were built, the promise of profit was not so certain. It was necessary to tempt investment by free right of way (which meant that the same volume of earnings would net a greater return upon the investment made), and by "land grants." [1]

[1] The status of these land grants has not been questioned in the discussion of rate regulation. Nor should it be. These grants were a part of the inducement for investment, but their disposition in no sense of the word necessarily concerned operations in the furnishing of transportation. The companies were free to keep the lands, as has the Northern Pacific to so considerable an extent; or to dispose of them, diverting the proceeds to payments to stockholders, or to the purchase of railroad plant. If the latter policy has been followed, the plant so created became a part of the investment of the company. But the grants were of land which it was never intended should be devoted to railroad purposes. They were a part of the bait which tempted the assumption of great pioneer risks, which otherwise would not have been assumed.

The Valuation Act (Section 19a of the Act to Regulate Commerce) provides for an investigation of "any aid, gift, grant of right of way, or donation, made . . . by the Government of the United States, or by any state, county, or municipal government, or by individuals," etc.

IV

No "actual cost" appraisal of a railroad property has been made. Even Mr. Hammond V. Hayes, who was one of the first to suggest the possibility of making such appraisal, expressed entire skepticism of the applicability of the expedient to the case of the railroad.[1] Very probably he is entirely right, for the St. Louis Commission has found great difficulty even in the case of a local public service company.[2] It is none the less worth while to in-

[1] "Original Cost versus Replacement Costs," *Quarterly Journal of Economics*, volume 27, page 628. Mr. Hayes is satisfied with the refinement arrived at by securing a unit price for "all elements for each year in the past," though, obviously enough, the cost of materials and labor are by no means constant through a year. But it is sufficient for our purpose (remembering this qualification) to accept his description of the engineering problem: "An inventory is prepared showing all plant units now in useful service. Such an inventory is identical with that required for ascertaining replacement cost. The age of each unit is ascertained and entered in the inventory . . . this figure for age is necessary for a determination of the loss in value of the investment arising from depreciation. From this age figure it is possible to find how many units of each class of elements were constructed in each year in the past. The sum of the products of the number of units constructed each year by the unit costs for that year will give the original cost. Overhead charges can be found for each year. . . . Thus it is seen that the method of determining original cost is practically the same as replacement cost, except that in the case of the original cost there are several unit costs, one for each year in the past for each element, whereas for replacement cost there is but one unit cost applicable to all units of the same kind." Hammond V. Hayes, *Public Utilities; Their Cost New and Depreciation*, page 108.

[2] The expressed intention of the St. Louis Commission was to arrive at figures representing fairly what those costs should have been "under all existing circumstances." Even on this basis it was not always easy to secure unanimity of opinion on unit costs; and for the older parts of the work, "through lack of reliable data," the Commission's engineers used "present prices." However, "having made a complete detailed inventory of the entire physical property . . . the Commission assigned to each item, as nearly as possible, its original cost in place and ready for service. These costs were, when possible, taken from actual signed contracts in the files of the company, and where such contracts did not exist, cost estimates were made from data for similar work, collected by the engineering staff of the Commission." *Report*, St. Louis Public Service Commission, on Rates, Union Electric Light & Power Co., pages 27, 28, 29.

dicate the scope of such an investigation. For it presents the only appraisal which is in accord with the trend of the previous reasoning. The programme is simple: the problem is to determine the amount of the "unimpaired investment." Take each unit of the plant (no matter how minute must be the classification of items), determine the amount of its original cost (including any "overhead"), appraise and deduct the accrued depreciation.[1] But this extended analysis, presumably made, even for "reproduction," involves endless detail. It is subject to all the sources of error in measurement and calculation which render the cost of reproduction figures inconclusive from the point of view of statistical significance. Mr. Hayes' verdict seems conclusive: attempt to make a cost appraisal of a railroad — excluding land, where everything depends on the state of records — would be in large measure fruitless. Perhaps the same conclusion would hold for land.[2]

The experience of the Interstate Commerce Commission in its attempt to secure figures satisfying the requirement of the Valuation Law, calling for "original cost to date," upholds this judgment. The Commission's accountants have sought to tie up entries on the books with the physical units of plant. The Texas Midland and the New Orleans, Texas & Mexico, the one a line of 112 miles, the other of 175 miles, were selected for experimental investigations. The results can be given in Director Prouty's own words:

See James E. Allison, "Ethical and Economic Elements in Public Service Valuation," *Quarterly Journal of Economics*, volume 27, pages 30, 31.

[1] To a total determined on this basis, the cost of plant acquired through "maintenance," etc., could be added in the future, and deduction for accruing depreciation or abandonment made without destroying the meaning of the figures. Always they would measure the volume of "savings" (in dollars) still embodied in the railroad property.

[2] See Minnesota Rate Cases, Record (G.N.), page 190 and following, and page 292 and following.

"We found that, with respect to certain things that could be done, and with respect to certain things it could not be done at all. As to the roadway and the tracks and everything which went into them, we could not tell anything about the place where the expenditures had been made. We could not tell to what part or what section of that road the expenditure should be assigned. With structures it was somewhat different. We could say that a certain amount of the expenses had gone to bridges, and we could say within certain limits that a certain expenditure had been made upon a particular bridge. For instance, $100,000 had been expended in one year on bridges. Now we could locate the particular bridges to the amount of $75,000 out of the $100,000, but there was still left $25,000 which could not be located, which simply meant bridges wherever the bridges might be.

"Not only that, we found it was impossible to tell whether the amount which had been expended upon a particular bridge completed that bridge. Here is a minute which shows that there has been paid out at different times upon a particular bridge $10,000, but you cannot see from the books of the company whether that $10,000 completed that bridge or whether there was some other expenditure for labor or materials which also went into that bridge." [1]

Mr. Prouty summarized his discussion by calling the figure found in this investigation a "practical nullity." It was his conviction that the work involved was "absolutely thrown away." He even expressed his hope that the Commission, seeing the uselessness of the task, would relieve the accounting office of the Division of Valuation of further attempt to secure "cost to date." [2] In so far as

[1] National Association of Railway Commissioners, 1914, *Proceedings*, 26th Annual Meeting, page 137 and following. The quotation is from a stenographer's transcript.

[2] *Ibid.* The Director of Valuation would also seem to hold that the previous charging to capital (betterments) or to operating was important for appraisal purposes:

"Now you see that that is a tremendous undertaking. It is a tremendous undertaking with respect to a little railroad like the Texas Midland. You have got to handle every item. You have got to examine it, analyze it, and assign it. That was done, with the conclusion that when your invest-

the policy of the Division of Valuation may be expected to direct the course of determining "final valuations" by the Interstate Commerce Commission, the largest emphasis would thus seem destined to fall upon "cost of reproduction." [1]

But a conclusion that the "level," or "volume," or "amount" of investment in plant cannot be determined

ment account had been rewritten it was good for nothing. In the first place, it is absolutely impossible to-day, as the books of account of the railroads in this country have been kept, to correct errors which may have been made in the original distribution of those items. Take a voucher for a pay-roll and a voucher for supplies. Here is a bill of timber. You cannot pass upon the question whether it was used for an addition and a betterment of that property, or whether it was used for a renewal which should properly be charged to operation. But, worse than that, there is no way in which you can tell what retirement has been made, and what retirement should therefore be taken out of that investment account. So that we felt that the investment account when rewritten was not much better than it was before we attacked it, and it is my own feeling that if you were to treat the books of every carrier in this country in that way, while you might detect and would detect many instances of mistakes, the general result would add very little to the knowledge which you now have, and it might be a source of misinformation rather than of more accurate information."

[1] Writing at a later date, however, Mr. Prouty recognized that "the value of a railroad for rate-making purposes has never yet been clearly defined." Still, are not "courts, commissions, and economists, one in the opinion that for the determination of this question, certain facts must be marshaled, of which the principal are, cost of reproduction new, cost of reproduction less depreciation, original investment in the property and the history of that investment"? Mr. Prouty then reverted to the "legal principle": "A railroad is entitled under the Constitution to a fair return upon the *fair value* of the property." C. A. Prouty, "Why the Valuation should not be discontinued," *Railway Age Gazette*, volume 58, pages 7–8 (January 1, 1915).

See also Mr. Prouty's address on "Valuation," reprinted in the *Railway Library* for 1913, page 215 and following. The notable cases handled by Mr. Prouty while on the Commission were the Advance Case of 1903, 9 I.C.C. 382; the Spokane Case, 15 I.C.C. 376; and the Eastern Advance Case of 1910, 20 I.C.C. 243. See also the testimony of B. H. Meyer, before the Senate Committee; and of Judson Clements, before the House Committee, *Senate Report on Valuation*, etc. It would seem that all three members of the Commission looked upon "cost of reproduction" as in itself an end.

with any usable degree of accuracy does not justify the use of "cost of reproduction" figures.[1] Even were "cost of reproduction" desired, not as an end in itself, but only as a rough measure of investment (i.e., *actual cost*), the result would be quite inconclusive. The most that could be expected from such figures would be a rough standard that might indicate, within very broad limits, the relative level of investment in different lines. If one road had a "cost of reproduction" of $30,000 a mile, and another of $60,000, there would perhaps be some rough indication that one line represented about twice the investment of the other. But the figures of "cost of reproduction" would not measure a "value" (i.e., an unimpaired investment in tangible property) of $30,000, or $60,000.

A challenge is thus directed at the possible usefulness of the present Federal "physical valuation" which seeks to determine the "cost of reproduction new" and the "cost of reproduction less depreciation" of the railroads. The figures can be only the grossest estimates, bearing no real relation to the problem of determining a reasonable long-run cost of producing transportation service. However detailed may be the field investigation, — and the Division of Valuation, though apparently committed to the illogical "adjacent land" test, plans also a thorough resurvey,[2] — a large element of error is inevitable. Dependence upon "judgment," "imagination," and "expert opinion," in measuring, in classifying, in choosing unit prices, in appraising depreciation, will render the figures

[1] See the discussion by G. F. Swain, *Proceedings*, Am. Soc., C.E., volume 40, pages 1418–19, an extreme example of this attitude; also the paper by W. J. Wilgus, presented at the meeting of October 1, 1913; and the discussion thereon by members of the society, *Transactions*, Am. Soc., C.E., volume 77, pages 203–345.

[2] See Instructions for the Field Work of the Roadway and Track Department of the Interstate Commerce Commission, Division of Valuation.

devoid of real usefulness in scientific calculation. This conclusion must hold quite apart from the unsoundness inherent in "cost of reproduction" as a measure of the reasonableness of income.

And there is always the danger that such figures, falling into uncritical hands, may have a meaning attached to them which they do not possess. It will be easy enough to translate totals gathered by a Government agency into terms of "value," though the figures actually represent at best only an engineering guess of "reproduction cost," a purely forced conception. Even the worthless State figures have been quoted as indicating that the gross capitalization of the roads appraised did not exceed the "investment." [1]

[1] See S. O. Dunn, *American Transportation Question*, page 113, and "The Valuation of Railways," *Atlantic Monthly*, volume 113, pages 411–12; Professor F. H. Dixon's paper on "Valuation and Capitalization," published by the Bureau of Railway Economics, 1911; and an address by Howard Elliott, of the New Haven, before the Alumni Association of the Massachusetts Institute of Technology, January 9, 1915. Mr. Elliott used the Washington figures, the South Dakota figures ("cost of reproduction new"), the Minnesota figures ("depreciation deducted"), without regard to the statistical premises on which the figures were gathered. He even ascribed weight to the *New Haven Validation Report*. See also Professor William Z. Ripley, *Railroads, Finance and Organization* (page 341), a series of tabulations based upon the State figures.

CHAPTER VI

THE INTANGIBLE ELEMENTS OF "FAIR VALUE"

THE assumed analogy between condemnation and regulation which led to the original suggestion of the "valuation" test has never been subjected to a reasoned analysis by the judiciary. The lower courts, where the point has been raised (and this has been infrequently) have seldom perceived "any difference in the principles applicable to the two cases." [1] Justice Swayze, of the New Jersey Supreme Court, however, drew a sharp line of distinction: in the case of condemnation, an "exchange

[1] Spring Valley W.W. *v.* San Francisco, 124 Fed. 574, 594; San Diego Water Co. *v.* San Diego, 118 Cal. 556, 567; Kings County Lighting Co. *v.* Willcox, 156 App. Div. N.Y. 603, 606. See Brief of Messrs. Dunlap, Norton and Lathrop for the Santa Fé, Evidence, 1910 Advances, page 3601; The Valuation Brief of 1915, pages 273–314; and Pierce Butler, of the railroad counsel, "Valuation of Railway Property," *Journal of Political Economy*, volume 23, page 23 and following.

Taxation methods as developed have, however, come to insist upon drawing a line between the "value" of the plant and the "value" of the franchise. And these "values" have not been exchange values, the subject of the discussion in the preceding paragraph, but "values" as determined by appraisal. Fixing upon a "physical value" of the plant, a rate of return has been calculated upon this. Then the amount of the net earnings, after deducting this "fair return," has been calculated and capitalized, the resulting figure being the "value" of the franchise. The basis for this insistence upon "franchise value" has been the fact that assessing railroad and public utility plants, under the general property tax, had failed to secure an amount as large as would be fixed were earnings capitalized. Insistence that the franchise was property, "taxable, inheritable, alienable," soon led to an attempt to tax its "value." The only way in which such a sum could be determined, was by the process of isolating a part of the net earnings.[1]

But to include the result of such a calculation in the basis used for measuring the reasonableness of the return is to step again into the vicious circle of reasoning. The amount of this "franchise value" is reflected in earnings once for all. These earnings cannot possibly be treated as

[1] The first conspicuous attempt to determine upon the "value" of "non-physical elements of railway property," for taxation purposes, was made by Henry C. Adams, in connection with the Michigan Appraisal of 1901. The appraised value of the physical properties which he used was the "valuation" based on "cost of reproduction less depreciation" made by M. E. Cooley, the inadequacy of which has been demonstrated. Further indication that Professor Adams has looked upon this "valuation" as worthy of serious consideration is found in his letter to former Chairman Knapp, of the Interstate Commerce Commission, quoted, *Senate Report on Valuation*, page 216. See Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 80.

E. R. Johnson has approved of the use of such a "valuation" in measuring the reasonableness of rates, as "equitable to all parties in interest — the public, the investor, and the railroad company." *American Railway Transportation*, pages 93, 94.

independent of the level of charges. To test the reasonableness of the return from earnings upon a "valuation" itself dependent upon the volume of earnings is, of course, to estop regulation.

Attempt to hold to the doctrine that regulation is *pro tanto* condemnation led Judge Hough, of the United States District Court, into this very difficulty. He had before him figures purporting to show the "present value" of the plants of the Consolidated Gas Company, determined by an "expert" appraisal. He was endeavoring to decide whether an amount should be added to this "value" to take account of the franchise which the company insisted was "property" from which an income could be "justly and lawfully demanded." [1] Refusing "to minimize and distinguish" the decisions which had assumed that condemnation and regulation were in spirit identical proceedings, it was left "to the higher tribunals to make distinctions which, if drawn by the lower court, would . . . savor of presumption." [2] Accordingly Judge Hough set about to determine the valuation of a franchise, which his common sense led him to believe should not be "valued."

Immediately he became hopelessly involved. "If its earning power be reduced by regulation, the value of the property is *pro tanto* reduced, and since the franchise is property, the value of the franchise is also reduced. . . . It is obviously true that *if franchises have inherent value*, and yet may be disregarded in regulating rates, it would be an easy matter to regulate profits as near the vanishing point as might be necessary, and then condemn property whose franchises had been so practically destroyed by regulation, at a price far below its *worth*." [3] Next pointing

[1] Consolidated Gas Co. *v.* New York, 157 Fed. 849, 875–76. Such allowance had been made by the Master on the capitalization basis.

[2] *Ibid.*

[3] *Ibid.*, page 876 (the italics are the writer's). It is possible that Judge

Taxation methods as developed have, however, come to insist upon drawing a line between the "value" of the plant and the "value" of the franchise. And these "values" have not been exchange values, the subject of the discussion in the preceding paragraph, but "values" as determined by appraisal. Fixing upon a "physical value" of the plant, a rate of return has been calculated upon this. Then the amount of the net earnings, after deducting this "fair return," has been calculated and capitalized, the resulting figure being the "value" of the franchise. The basis for this insistence upon "franchise value" has been the fact that assessing railroad and public utility plants, under the general property tax, had failed to secure an amount as large as would be fixed were earnings capitalized. Insistence that the franchise was property, "taxable, inheritable, alienable," soon led to an attempt to tax its "value." The only way in which such a sum could be determined, was by the process of isolating a part of the net earnings.[1]

But to include the result of such a calculation in the basis used for measuring the reasonableness of the return is to step again into the vicious circle of reasoning. The amount of this "franchise value" is reflected in earnings once for all. These earnings cannot possibly be treated as

[1] The first conspicuous attempt to determine upon the "value" of "non-physical elements of railway property," for taxation purposes, was made by Henry C. Adams, in connection with the Michigan Appraisal of 1901. The appraised value of the physical properties which he used was the "valuation" based on "cost of reproduction less depreciation" made by M. E. Cooley, the inadequacy of which has been demonstrated. Further indication that Professor Adams has looked upon this "valuation" as worthy of serious consideration is found in his letter to former Chairman Knapp, of the Interstate Commerce Commission, quoted, *Senate Report on Valuation*, page 216. See Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating Property*, page 80.

E. R. Johnson has approved of the use of such a "valuation" in measuring the reasonableness of rates, as "equitable to all parties in interest — the public, the investor, and the railroad company." *American Railway Transportation*, pages 93, 94.

independent of the level of charges. To test the reasonableness of the return from earnings upon a "valuation" itself dependent upon the volume of earnings is, of course, to estop regulation.

Attempt to hold to the doctrine that regulation is *pro tanto* condemnation led Judge Hough, of the United States District Court, into this very difficulty. He had before him figures purporting to show the "present value" of the plants of the Consolidated Gas Company, determined by an "expert" appraisal. He was endeavoring to decide whether an amount should be added to this "value" to take account of the franchise which the company insisted was "property" from which an income could be "justly and lawfully demanded." [1] Refusing "to minimize and distinguish" the decisions which had assumed that condemnation and regulation were in spirit identical proceedings, it was left "to the higher tribunals to make distinctions which, if drawn by the lower court, would . . . savor of presumption." [2] Accordingly Judge Hough set about to determine the valuation of a franchise, which his common sense led him to believe should not be "valued."

Immediately he became hopelessly involved. "If its earning power be reduced by regulation, the value of the property is *pro tanto* reduced, and since the franchise is property, the value of the franchise is also reduced. . . . It is obviously true that *if franchises have inherent value*, and yet may be disregarded in regulating rates, it would be an easy matter to regulate profits as near the vanishing point as might be necessary, and then condemn property whose franchises had been so practically destroyed by regulation, at a price far below its *worth*." [3] Next pointing

[1] Consolidated Gas Co. *v.* New York, 157 Fed. 849, 875–76. Such allowance had been made by the Master on the capitalization basis.

[2] *Ibid.*

[3] *Ibid.*, page 876 (the italics are the writer's). It is possible that Judge

out that the method of assessment for taxation involved a capitalization of earnings (above a "fair return on the assessed value of the plant"), he indicated that, while this was "undoubtedly an easy and convenient method of ascertaining the value of the franchise," it failed to recognize that "as long as the tangible property earns anything, and the franchise exists, the franchise contributes to the earning power, because it is only by virtue of the franchise that anything at all is earned." There is even a candid recognition of the existence of the fallacy, followed almost immediately after with the statement that "the value of a franchise depends wholly upon what is earned under it," [1] whether regulation or condemnation be under consideration.[2] The result of this wavering and contradiction was the assignment of an arbitrary sum as the value of the franchises.[3]

Hough introduced this reasoning in order to bring the issue to the attention of the Supreme Court. If so, he failed completely to secure the result desired. See Consolidated Gas Co. *v.* Mayer, 146 Fed. 150, 157, the decision at the time the temporary injunction was granted. The argument here influenced the Master, A. H. Masten, who reported to Judge Hough. See Report of the Master, pages 186, 200, 204, 210, Willcox *v.* Consolidated Gas Co., 212 U.S. 19.

[1] Consolidated Gas Co. *v.* New York, 157 Fed. 877, 878.

[2] The Brief of John A. Garver, on "Franchises" for the Company, Willcox *v.* Consolidated Gas Company, 212 U.S. 19, is full of this same circular reasoning. See especially pages 20–23. At page 23 he cited Smyth *v.* Ames, 169 U.S. 466, declaring, "In Smyth *v.* Ames, the Court, in considering the method of ascertaining the value of the property, employed language which necessarily included special franchises, stating (page 547) that there should be included the amount and market value of its stocks and bonds . . . the probable earning capacity of the property."

[3] On appeal, Justice Peckham took refuge behind a technicality, and, though indicating that he understood the connection between "franchise value" and earnings, made an allowance for the franchise at the amount at which it had been capitalized when the company was formed; though using an appraisal of the existing "physical" assets. But he made the clear reservation that his decision could form no precedent where similar facts did not exist. (212 U.S. 19, 44–48.) Whitten, *Valuation of Public Service Corporations*, pages 594–612, is devoted to an extended discussion of the facts peculiar to this case.

See Cedar Rapids Gas Light Co. *v.* Cedar Rapids, 223 U.S. 655, 669;

But, entirely aside from the analogy which has been assumed to exist between regulation and condemnation proceedings, is there not "force" in "the argument that the franchise ought to be worth something for rate-fixing purposes, if it is worth millions for taxation"? [1] So long as the railroad pays a "franchise tax," should not the "value" of the franchise be included in the measure of reasonableness? An affirmative answer to this question was secured by the Masters in the Alabama Rate Cases through invoking a theory of estoppel. And Judge Jones, to whom their Reports were submitted, accepting the conclusion without the formality of examining the premises on which it was based, was content merely to "cite the authorities." [2] The Reports of the Masters, therefore, contain the essential steps in the argument.[3] Mr. Gunter's Report in the South and North Alabama Case includes the portions germane to the present discussion.[4]

The State Tax Commission had determined the "true value, for taxation, of franchises or intangible property" by deducting "the assessed value of the tangible, real and personal property" from the market value of the stocks

and especially Public Service Gas Co. *v.* Board of Public Utility Commissioners, 87 Atlantic 651, a decision of Justice Swayze, of the New Jersey Supreme Court. The latter opinion was overruled by the New Jersey Court of Errors and Appeals, which, citing taxation and condemnation cases, reversed the Supreme Court, because the "value" of the franchise had been ignored in determining the basis for measuring the reasonableness of the return. Public Service Gas Co. *v.* Board of Public Utility Commissioners, 92 Atlantic 606. This opinion was then overruled in 94 Atlantic 634.

[1] Spring Valley Water Co. *v.* San Francisco, 165 Fed. 649, 667, 696. See Consolidated Gas Co. *v.* Mayer, 146 Fed. 150, 157; and G. F. Swain, the *New Haven Validation Report*, page 57.

[2] L. & N. R.R. Co. *v.* R.R. Commission of Alabama, 196 Fed. 800, 822, 823.

[3] Report of W. A. Gunter, Special Master, South & North Alabama Case, page 42; Louisville & Nashville Case, page 98; Report of W. S. Thorington, Special Master, Central of Georgia Case, page 105; Western of Alabama Case, page 51.

[4] Mr. Gunter's Reports, finished in advance of those of Mr. Thorington, were drawn on by the latter for argument and conclusions.

and bonds.[1] Surely "corporate property, highly rated and taxed by the State through an official commission having such matters in charge, should be represented in the rates allowed by the State." [2]

That this "franchise value" was found by a capitalization of earnings (through the medium of the securities market) troubled neither of the Masters; nor, for that matter, the Court to which they reported.[3] The danger seems at one time to have been realized, at least by Mr. Gunter: "When the question is one of the reasonableness of rates, the value which determines the rates should not be determined by the rates themselves, or revenues based on them."[4] But when the attorneys for the State protested, alleging that the value of the franchise was based upon earnings ("the capacity to earn profits"), they were met with the answer that the same objection would apply to "almost all" the railroad property. "The value of its structure is based on the capacity to earn profits, and in large part would be worthless without this feature, and would become more valuable as profits increased." [5] Mr. Thorington spoke in similar vein: "This argument goes too far; the proposition is equally true of the physical properties of a railroad; their value depends on the earning capacity of the road, and fluctuates with the earning ca-

[1] See General Laws of Alabama, 1907, pages 342, 348. The Masters' Reports give figures, but do not indicate the process of their determination. The amounts, of course, vary from year to year.

[2] Report of W. A. Gunter, South & North Alabama Case, page 43; Louisville & Nashville Case, page 99; Report of W. S. Thorington, Central of Georgia Case, page 106; Western of Alabama Case, page 52.

[3] L. & N. R.R. Co. *v.* R.R. Commission of Alabama, 196 Fed. 800, 822; Western of Alabama Ry. Co. *v.* Same, 197 Fed. 954. Both cases are cited in the Valuation Brief of 1915, page 527.

[4] Report, South & North Alabama Case, page 82.

[5] *Ibid.*, page 42; Report, Louisville & Nashville Case, page 98. It is this argument which commended itself to Mr. Thorington as "being sound" (Report, Western of Alabama Case, page 55); and to Judge Jones as representing "able" treatment (L. & N. R.R. Co. *v.* R.R. Commission of Alabama, 196 Fed. 800, 822).

pacity." [1] These rulings clearly work into the circle. And this taint must bar, once for all, any "valuation" of the franchise which is not entirely independent of earnings. In other words, has the franchise a "*cost*"? If so, such a cost would constitute a legitimate organization expense.

II

What has been meant by "strategic value" can be best shown by a discussion of the "market value" test of the Washington Commission. The Washington Commission fell into the error of attempting to capitalize the differential gains accruing to the better situated railroads in the State, and to use a figure so determined as a measure of the reasonableness of rates. But, since everything was done through the "exercise of judgment," the vicious reasoning is not readily apparent. The difficulty with the Washington Commission originated in a conscious effort to apply the "rule" in Smyth *v.* Ames.[2] But the "market value" as "found" by the Commission had no reference to selling price. It was a "true market value," fixed "as a fact" by members of a Commission "attempting" to act as would "intelligent business men." The Commission assumed that the considerations governing a "prudent business man" in the purchase of the property, or those of the owners in fixing a selling price, were "the same considerations that should govern a railroad commission in determining the market value of a railroad property." [3]

[1] Report, Central of Georgia Case, page 105.

[2] *First Annual Report*, Railroad Commission of Washington, pages 10 and 15; *Second and Third Annual Reports*, page 127.

[3] Report of the Committee on Railroad Taxes, etc., *Proceedings*, 22d Annual Meeting, National Association of Railway Commissioners, discussion, pages 146, 147, 148. This Report (a paraphrase of *Reasonable Railway Rates*, by J. C. Lawrence, of the Washington Commission) was apparently written by Mr. Lawrence, to describe the Washington method, which, the Report declared, solved "impossible problems." At any rate, he alone took up the burden of its defense, although the

And what were these considerations? The "most important facts" were (according to the Washington Commission):

> "The actual cost of construction.
> "Cost of reproduction new.
> "The depreciated value.
> "The amount and market value of the stocks and bonds issued, with a full financial history of the road.
> "The density of population and traffic.
> "The nature and permanence of population and traffic.
> "Facilities for doing business.
> "Physical characteristics.
> "The amount of earnings and operating expenses." [1]

Under each of these subheadings, the Commission made formal "findings of fact." [2]

For the Great Northern, for the Northern Pacific, and for the Oregon Railroad and Navigation Company, the three principal lines, the "findings" were in large measure parallel. There was a high density of traffic combined with a permanent population, "adding value to the said lines." Similarly, the presence of grain elevators, flour mills, sawmills, promised the continuance of traffic which could be economically handled. This insurance of traffic and the possession of adequate terminals, warehouses, and docks,

Report was signed by B. H. Meyer, of the Interstate Commerce Commission, and others.

[1] "All of the facts . . . are pertinent . . . but none are controlling." Report of the Committee on Railroad Taxes, etc., *ibid.*, page 139. See also *First Annual Report*, Railroad Commission of Washington, page 315; and J. C. Lawrence, *Reasonable Railway Rates*, page 3. Also the Interstate Commerce Commission, In the Matter of Advances, etc. (1903), 9 I.C.C. 382, 402: "Moreover, the value of a railway system does not depend upon the mere cost of its embankment or its equipment. It is rather a question of its location, of connections, of terminal facilities, of enterprises, along its line; and shall nothing be allowed to the foresight and ability which have marked out and perfected that system?"

[2] Valuations made on this basis were upheld for tax purposes by the Washington Supreme Court. Northern Pacific Ry. Co. *v.* The State, 147 Pacific 45.

added "a value." [1] These elements were important particularly because of their effect upon gross earnings. Favorable gradients and curvature (the "physical characteristics"), on the other hand, were reflected in low operating costs.[2] And so, at tedious length, the Commission accounted for every mile of curvature (never the degree, the really significant item), and every foot of rise and fall, though omitting the important factor in tonnage rating, the ruling grade. And where, as with the Oregon Railroad and Navigation Company, the haul was almost entirely

[1] *Second and Third Annual Reports*, Railroad Commission of Washington (N.P.), page 165; (G.N.), page 287; (O.R. & N. Co.), page 421. See testimony of Frank Nay, Comptroller of the Rock Island, Evidence, 1910 Advances, page 365; of C. J. McPherson of the Missouri Pacific, *ibid.*, page 846, and of Howard Elliott, Minnesota Rate Cases, Record (N.P.), page 1257 and following. Also the Valuation Brief of 1915; pages 483–86, 512–14.

[2] J. C. Lawrence, *Reasonable Railway Rates*, page 9; *Second and Third Annual Reports*, Railroad Commission of Washington, pages 185–91, 351–53, 432–34.

The following summary of the testimony of Howard Elliott, on the elements on the Northern Pacific property "adding value in addition to the mere physical values of its component parts," is here pertinent:

Mr. Elliott "described the location of the lines, the character of the country, towns and cities, through which they run, the terminal facilities owned at points where traffic is received or delivered, the growing character of the country and the nature of the tonnage tributary to the road, demonstrating how all of these elements create values in the property. He analyzed the grades, showing that they are favorable and calculated to permit the Northern Pacific lines to meet competition; demonstrated that the property has been well cared for and is widely known; that it possesses an efficient organization; that it reaches from the Great Lakes to tide-water on the Pacific Ocean, and that, it being the pioneer line in many of the communities through which it runs, industries have been built up about it and are, therefore, naturally tributary to it. This creates a constant current of traffic toward it and in a country where population is growing and commerce increasing, it demonstrates that the property has future prospects for growth in business. He finally summed up all of the elements of intangible values thus referred to by saying, that while it is impossible to measure by any sum the amount of such values, in his judgment the property, as a commercial enterprise for doing a transportation business, is worth at least fifteen per cent more than the same system newly constructed." Brief for the Companies, page 359, Minnesota Rate Cases, 230 U.S. 352.

down grade, a relatively high "market value" was the result.[1]

The Northern Pacific even had "great value" added to its lines through the possession of control of the Northwestern Improvement Company, from which it bought coal at a price considerably under that paid by the other Washington roads.[2] Similarly, a value was added "where a road had electrified its operations over mountain grades by use of water power which it owns, cheapening and safeguarding operations."[3] And the road, so located that it could not be paralleled and made to suffer from competition, occupied a "strategic position" to be recognized in a determination of "market value."[4]

This "market value" was fixed by the Commission "as a fact." A market value determined by consideration of security quotations "would be a good deal like lifting ourselves by our bootstraps."[5] Yet a circuitous resort to "judgment" in no sense evades the circle in reasoning, which looks to exchange value as a test of reasonableness. The factors, which the Washington Commission insisted "added" a "value," are significant only because of their relation to earnings. Clearly they bear no relation to cost or investment. The Commission was insisting upon a capitalization of the net earnings which accrue through the

[1] *Proceedings*, 22d Annual Meeting, National Association of Railway Commissioners, page 147. The same point was made in 1886 by James Fentrees, one of the counsel in Stone *v.* Farmers' Loan and Trust Co., Brief, page 26, 116 U.S. 307; likewise by R. E. T. Riggs, "Problems of Railroad Valuation," *Columbia Law Review*, volume 13, page 585.

[2] *Second and Third Annual Reports*, Railroad Commission of Washington, page 165.

[3] J. C. Lawrence, *Reasonable Railway Rates*, page 9.

[4] *Proceedings*, 22d Annual Meeting, National Association of Railway Commissioners, page 148, and page 144, referring to the O.R. & N. Co. See L. & N. Ry. Co. *v.* R.R. Commission of Alabama, 196 Fed. 800, 820, where competition is indicated as lowering "value."

[5] Mr. Lawrence so declared in the discussion of his Report, *ibid.*, page 147.

possession of differential advantages, a capitalization of the economic rent of the site.[1]

The same fundamental problem appeared in the Minnesota Rate Cases, though presented in a slightly different light. A large part of the railroad holdings in the Twin Cities lay along the Mississippi, and in Duluth, along the harbor front, an entirely typical situation. In St. Paul, for example, the peculiar topography (the city rising high above the river bottom where the yards lay) restricted very materially the area available for railroad terminals possessing easy access to the business district.[2] (It would have been contrary to the hypothesis to assume the business district elsewhere than in the location near the existing yards, where it had grown due to the very presence of the yards!) Accordingly the experts hired by the railroads to make a "valuation" took into consideration the fact that the most available use of the bottom and "plateau" lands would be for railroad purposes. Railroad use representing one of the "highest uses of land," it was possible to fix prices per square foot considerably above what the value of the land would be if occupied by broken-down hovels—the other great "use" for the bottom lands in American

[1] Nowhere is the entire failure of the Washington Commission to grasp the problem better illustrated than in the following statement of Mr. Lawrence: "The Chicago, Milwaukee and Puget Sound started the construction of its line through the State of Washington, almost paralleling the Northern Pacific, and we asked the question: which is worth more, costing the same, the Milwaukee paralleling the Northern Pacific, new roadbed, no facilities for doing business, not established as a going concern, or the Northern Pacific, long in business, warehouses, factories, industries of all kinds built up, with the facilities for doing business, and actually doing a profitable business as a going concern; which is worth the more? Would not the Milwaukee pay the Northern Pacific far more than the cost of its property now rather than expend a similar sum, and then wait for the business to come?" *Proceedings*, 22d Annual Meeting, National Association of Railway Commissioners, pages 173–74. All of this, however true, is of course simply beside the point. It is sufficient to ask: what of it?

[2] Minnesota Rate Cases, Record (N.P.), page 1127; see testimony of D. C. Morgan, pages 2001, 2006, 2008.

cities.[1] The same general method was followed in Minneapolis. In Duluth, however, in the Master's phrase, "the appraisers were much more moderate in fixing values and seemed to have adjusted the same with reference to the adaptability of the property for general business enterprises, and not to have taken into account their special and increased value for railroad purposes." This error the Master corrected by increasing their figures by twenty-five per cent to cover both the "railroad value" and an allowance for acquisition and consequential damages. In the other cities he made an allowance of five per cent to cover the latter factors.[2]

Judge Sanborn accepted the land "valuations" reported by the Master; Justice Hughes in the Supreme Court rejected them unceremoniously. The grounds for his rejection were two in number; the one looking simply to the precedents cited from the field of condemnation, the other looking more deeply into the economic problem. In the

[1] Minnesota Rate Cases, Record (N.P.), page 1425. See testimony of J. J. Hill, Record (G.N.), page 1347.

The following excerpt from Mr. O. L. Taylor's testimony illustrates the theory of the experts and of the railroad:

"Q. I understood you to say that railway property for terminals and right of way occupies a class of its own?

"A. Yes, it is not to be compared with ordinary isolated pieces of real estate.

"Q. Why shouldn't you compare a right of way or a terminal occupied for railway purposes with adjacent property?

"A. In the first place, it is put to a different use; the value as based on that use is different. In the second place, it becomes an entire and completed creation; it ceases to be a commodity that is offered in the general market; it is not dependent on the little fluctuations, the temporary stringency of money, the individual necessity of sale, and the various elements that go to make the prices of real estate viewed as an ordinary salable commodity.

"Q. Then would you not expect the railroad property to follow the fluctuations of property immediately adjacent to it?

"A. Not to any appreciable extent."

Record (G.N.), page 377.

[2] Report of Chas. E. Otis, page 222. See testimony of J. D. Stryker, of the Duluth appraisers, Record (G.N.), page 600.

event of condemnation proceedings, it was held, an owner would not be entitled to demand payment of an amount which property might be deemed worth to the company; nor payment of an enhanced value by virtue of the purpose for which it was taken. There was no sound basis, therefore, for allowance of such imaginary amounts in the case of appraisal for measuring reasonableness. And these conclusions Justice Hughes supported by citation of authorities: "Supposing the railroad to be obliterated, and the lands to be held by others, the owner of each parcel would be entitled to receive, on its condemnation, its fair market value for all its available uses and purposes," declared Justice Hughes. Indeed, "if in the case of any such owner, his property had a peculiar value, or special adaptation for railroad purposes, that would be an element to be considered." It is not easy to harmonize these citations with the conclusion drawn:

> "But still the inquiry would be as to the fair market value of the property; as to what the owner had lost, and not what the taker had gained. The owner would not be entitled to demand payment of the amount which the property might be deemed worth to the company; or of an enhanced value by virtue of the purpose for which it was taken; or of an increase over its fair market value, by reason of any added value supposed to result from its combination with tracts acquired from others so as to make it a part of a continuous railroad right-of-way held in one ownership." [1]

This mode of handling, of course, represented a mere maintenance of the condemnation analogy; an extension of principles developed to cover an entirely different fundamental issue. The holding of the Court standing alone, therefore, is hardly final for the economist.

Nor have the railroad attorneys accepted the doctrine as

[1] Minnesota Rate Cases, 230 U.S. 352, 451, citing Boom Company *v.* Patterson, 98 U.S. 403; Shoemaker *v.* U.S., 147 U.S. 282; U.S. *v.* Chandler-Dunbar Water Power Co., 229 U.S. 53.

conclusive.[1] The failure to reject outright the condemnation analogy has resulted in a return to the attack. The Valuation Brief of 1915 cited the cases used by Justice Hughes (and the Minnesota Rate Cases as well), in support of the contention urged:

> "In the case of right of way, station grounds and terminals, as in the case of other lands of considerable area, the value of the whole is greater than the sum of the values of the parcels comprising the same, and there are elements, such as continuity, shape, suitableness for railroad use, etc., which must be taken into account and allowed for." [2]

Unless there shall be a clean-cut enunciation of the principle that regulation is not condemnation, and that different considerations govern the two sets of cases, a consistent argument based on citations may be maintained in these terms, however inadequate the analysis.

But Justice Hughes' further discussion went straight to the basis of the difficulty: "For the purpose of making rates is land devoted to the public use to be treated (irrespective of improvements) not only as increasing in value by reason of the activities and general prosperity of the community, but as constantly outstripping in this increase, all neighboring lands of like character, devoted to other uses?" No. And why? Because "the railway value of land" — "a large body of land in continuous ownership," representing one of the "highest uses of land" — is "an increment which in the last analysis must rest on an estimate of the value of the railroad use as compared with other business use; it involves an appreciation of the returns from rates, which rates themselves are in

[1] The Valuation Brief of 1915, page 273: "The present value of each piece of land used for transportation, must be determined upon the same principles which govern in case of condemnation of private property for public use"; citing Reagan *v.* Farmers' Loan & Trust Co., 154 U.S. 362; Ames *v.* Union Pacific, 64 Fed. 165.

[2] See the Valuation Brief of 1915, page 314 and following.

dispute." [1] In other words, "railway value," at a date subsequent to the time of original purchase, means a capitalization (surely a hazy procedure in the minds of the appraisers anyway) of the differential advantages possessed by the site. The reason why a railroad company is ready to pay high prices for land which it can use for yards and depot grounds, without considerable grading, is because of the necessity of conforming to construction standards. The low land, therefore, possesses a differential advantage over tracts where large amounts of excavation or fill would be needed. It is this fact which accounts for the presence of the railroad in river valleys everywhere. Not because the use for railroad purposes represents a higher use does land, valueless, or nearly valueless, for other purposes acquire value, but because the possession of level land means a saving in building and a saving in operation. The "higher use" is a result, not a cause. So much is commonplace analysis in terms of the theory of rent.[2]

[1] Minnesota Rate Cases, 230 U.S. 352, 453–55.

[2] The following excerpt from the record does combine a consideration of the "higher use" with a realization of the differential advantage, but in very unsure language:

"A. But, you take the property going up Trout Brook or Phalen Creek gorges, it has almost no value from a residence point of view — down in a gulley, subject under normal conditions to overflow, deprived of proper ventilation, and almost wholly unfit for ordinary purposes of dwellings; and yet, offering a unique and ideal situation for a railroad, escaping grade crossings, coming into the city on the level of the river, and having any number of very unusual and valuable features from a railroad point of view; but for all ordinary real estate purposes, having next to no value.

"Q. The result of that is that the gorge being available for railway purposes, that land becomes normal does it not?

"A. Becomes normal?

"Q. Yes. If there were going to be no railroads, the fact that it was in the gully, the fact that it is barren, as well as the fact that there is no proper ventilation, would practically deprive it of any value, wouldn't it?

"A. It would to a very large extent.

"Q. Yes; but because it can be used for a railroad purpose, it becomes normal land, does it not?

"A. No; it becomes abnormal, because it jumps right over the ordinary

Yet the railroad appraisers, the railroad attorneys, and the Master, in insisting upon the concept of the "railroad value of land," however uncertain their statement, were entirely right if the problem be conceived of as one in the determination of "value." For the value of land in any case depends upon the capitalization of the rent which accrues on that land.[1] This is true of agricultural land; and it is true of urban sites. It is equally true of land devoted to the railroad service, once for all. Much land, indeed, worthless for agriculture, and far from urban centers, is extremely "valuable" when sought for railroad construction. The possession of a canyon pass, a river-bank, or a sloping hillside may well mean saving in original outlay and in operating costs through all time. Such land is in a position essentially similar to that occupied by rich land located close to a market, or to the site on the busiest corner of a city. Lands peculiarly suited for the use of a railroad are in demand because they do offer differential advantages; but the extent of these advantages can be measured only through the effect on income.[2] Strategic

use to be capable of that very highest, or one of the highest, uses to which lands can be put.

"Q. You think it is better, you think the barrenness of the soil, and the lack of ventilation, and the curving of the gorge make it better for railroad purposes?

"A. Not the curving of the gorge, but the general topographical situation; the fact of its being below the grade renders it of just the value that it would cost to cut that out.

"Q. Yes; that is right.

"A. Above what it would be if it was on a level.

"Q. Yes; it may be worth the additional amount that it would cost to cut that out?

"A. Yes."

Testimony of O. L. Taylor, Minnesota Rate Cases, Record (G.N.), page 886.

[1] By "rent," meaning "strict economic rent," "site rent." See F. W. Taussig, *Principles of Economics*, volume 2, chapters 42–44.

[2] See argument of T. W. Hulme, Valuation Conference of May 27–29, 1915, *Proceedings*, pages 120–27; and especially the classic discussion in Wellington, *Economic Theory of Railway Location*, chapters III–V.

situation, adaptability, "railway value," mean nothing until that advantage is realized in terms of income. How otherwise "value" the Royal Gorge occupied by the Denver and Rio Grande Railroad, or the Delaware "Water Gap"? [1]

III

That there can be a substantial difference between "good-will" and "going value" from the economic point of view is difficult to see. The courts have insisted that such a difference exists. But the basis for this insistence has been purely technical. Good-will, in the standard definition of the American courts, is "all that disposition which customers entertain toward the house of business identified by the particular name or firm, and which may induce them to continue giving their custom to it." [2] What has since come to be known as "going value" was described by Justice Brewer, in a case involving the taking over of a water plant, as "the value which flows from the established connections between the pipes and the buildings of the city." [3] Now, since the customer who deals with a monopoly must resort to the old stand or go without, his disposition toward such a company can count for naught. Good-will is a characteristic of competitive industry.[4]

[1] See also the discussion, below, page 203.

[2] Washburn *v.* National Wall Paper Co., 81 Fed. 17, 20.

See Cedar Rapids Gas Light Co. *v.* Cedar Rapids, 120 Northwestern 966, 969.

[3] National Water Works Co. *v.* Kansas City, 62 Fed. 853, 864; followed, in substance, Omaha *v.* Omaha Water Co., 218 U.S. 180, 203, and in the cases there cited.

[4] See Willcox *v.* Consolidated Gas Co., 212 U.S. 19, 52; Spring Valley W.W. *v.* San Francisco, 192 Fed. 137, 168.

The following, from the testimony of Commissioner B. H. Meyer before the House Committee on Interstate Commerce, in 1913, seemingly reflects, on the part of all speakers, a neglect of the *economic* as distinguished from the *legal* concept:

"Mr. Meyer. Having the value of the physical property, which is, of course, the largest task in the ascertainment of the different elements of

But the *economic* significance is the same in either case; and there is, consequently, no present responsibility to attempt classification of the railroad business as competitive or monopolistic. Good-will depends upon the assurance of earnings; so does "going value," "connected value." They represent the same kind of costs (if any): the expense of establishing permanent business relations. That in the one case poor service may mean a loss of custom, and that in the other no usable alternative is at hand, does not destroy this fact of *cost*, which, for our purpose, is the significant one. Neither good-will nor "going value" can here be measured as a function of earning power.

Members of the engineering profession have, nevertheless, used a capitalization of earning power to determine upon the amount of the "going value." But their process of capitalization is a very complicated one, representing the results of a series of hypotheses governed entirely by "expert" judgment. In the first place, the present plant is assumed to disappear, a new "phantom" plant, without any business, being erected in its place.[1] For a period

value that enter into a fair valuation, the Commission can, when necessary, inquire into the other elements of value. What, for instance, if anything, shall be allowed as going value?

"I assume a railway, because of the monopolistic character of its business cannot claim value under the head of good-will, as a gas company might conceivably, but I believe the Supreme Court has held even a gas company may not include good-will as an element of value; but such claims have been made. Now, whatever justice there may be in such claims is a matter of inquiry in each specific case.

"The Chairman. A company having an absolute monopoly would have more good-will than anybody else, wouldn't they?

"Mr. Meyer. When that question was first urged, before I came to Washington, I remember asking attorneys, who were urging it, if, in their judgment, regulating authorities would consider good-will as an asset, whether by the same process of reasoning they should not also consider ill-will as a liability; and the argument was not pressed.

"Mr. J. A. Martin. On that basis this Washington Traction Company would not be worth anything, if I was valuing it."

Senate Report on Valuation, page 225.

[1] "Each is occupying the field independent of the other, one with the business and the other without." Testimony of President Wheeler, of the

(the length of this period being dependent upon the will and judgment of the appraiser), the earnings of the hypothetical plant are assumed to be below those of the existing plant. Then, "the sum of the present worths of the annual excess in net return" received by the existing plant, until such time as the earnings of the comparative plant catch up, "represents the amount which a purchaser could afford to pay for the existing property with its established income in excess of the value of its bare physical plant" (as fixed by appraisal).[1]

Quite aside from the validity of the premises, a discussion of which is postponed for the moment, it is clear that the proposed scheme places a premium on conjecture. And this conjecture is in a field where there is no possible check through even the roughest measurement. How rapidly will the "phantom" plant, the "comparative" plant, acquire earnings? What shall be the rate of capitalization for determining the "present worth" of the hypothetical excess in revenue? How great will be the annual operating expenses? etc., etc.[2] The man who would presume to make such a calculation for an American railroad system would prove himself truly courageous. The scheme can only be described as a revelry of conjecture which presents "expert opinion" in the worst possible light.

But there is the logical bar to the use of such a method of calculation when rates are in question. The revenue accrues from rates already in effect, and there can be no

water company, Knoxville *v.* Knoxville Water Co., Record, page 2138, 212 U.S. 1.

[1] Leonard Metcalf and John W. Alvord, "The Going Value of Water Works," *Transactions*, Am. Soc., C.E., volume 73. Discussed at length in Whitten, *Valuation of Public Service Corporations*, chapter XXIII, pages 500–19. Mr. Alvord presented computations based upon these hypotheses in Green Bay *v.* Green Bay Water Co., 12 W.R.C.R. 236; and in Milwaukee *v.* Milwaukee Gas Light Co., 12 W.R.C.R. 441, both rate cases.

[2] See Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 152–53. These two pages are devoted to the fourteen hypotheses involved in making a "comparative plant" estimate of the "going value" of the company.

measure of reasonableness, which is dependent for its amount upon the level of charges. It is extraordinary that this difficulty has appeared "only imaginary" to the expert who was one of the originators of the scheme.[1] But the commissions to whom the calculations on this basis have been presented, have usually, but not always, been of another mind. And rightly so.[2]

There have been few calculations purporting to measure the "going value" of a railroad.[3] Nor have the State appraisals made attempt to secure such figures. The railroad attorneys have been content to cite the conclusion of Justice Brewer and have urged that "there should be added something in addition to the cost of reproducing the property."[4] Their aim has been simply to set the "cost of

[1] Benezette Williams and C. B. Williams, *Report to the Mayor and City Council on Water Rates for Peoria, Illinois*, page 27. The essentials of the "comparative plant" hypothesis were worked out by the former, who persistently talks in a circle when discussing the subject. See quotations from his remarks and report on the Peoria situation, in Whitten, *Valuation of Public Service Comporations*, page 502 and following. The reason why the difficulty in so basing "going value" is, in his mind, "imaginary," lies in the assertion that the "discriminating appraiser can determine from the revenue, within small limits, whether the rates are too high as a whole, to give a proper basis for computing going value, and he can always correct the going value to conform to the proper revenue after it has been determined." *Peoria Report*, page 27; Whitten, page 512.

[2] See Hill *v.* Antigo Water Co., 3 W.R.C.R. 623, 716, and the decisions outlined in Whitten, *Valuation of Public Service Corporations*, page 1280 and following (volume II). It would seem that in Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 151–55, 159, the Wisconsin Commission did accord serious attention to the scheme. And Former Chairman Erickson, in an address before the Western Society of Engineers, failed to frown upon a use of the "comparative plant" method: "This reproductive cost and the actual original cost of the business can then be compared, and the determination of the *going value*, or cost of the business, *then depends upon the exercise of a sound judgment*, based upon these two costs." *Railway Age Gazette*, volume 54, page 756. (Italics, the writer's.)

[3] See Montana, Wyoming & Southern R.R. Co. *v.* Board of Railroad Commissioners, 198 Fed. 991, apparently the exception.

[4] The words here quoted are from the argument of Burton Hanson, Evidence, 1910 Advances, page 4286.

reproduction" as a lower limit. These tactics were pursued by some of the attorneys for the railroads in the 1910 Advance Cases,[1] and by the railroad counsel in the Minnesota Rate Cases.[2]

This argument has been supported by citations from quite another series of decisions, handed down during the period when the "valuation" doctrine was unfolding — opinions also written by Justice Brewer. In Cleveland, Cincinnati, Chicago and St. Louis Railway Company *v.* Backus, the "unit rule" of taxation was developed. The "value" of the road as a whole was determined, and the "value" of the line within the State was apportioned on a mileage basis.[3]

> "The true value of a line of railroad is something more than an aggregation of the values of separate parts of it,

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[1] Brief of Burton Hanson for the C.M. & St.P., Evidence, 1910 Advances, page 3713; Brief of C. M. Dawes for the C.B. & Q., page 3635; Brief of G. W. Seevers for the M. & St.L., page 3921. See also, Brief for the Companies, Minnesota Rate Cases, page 334.

The argument is found in the Brief of J. M. Woolworth for the Companies in Smyth *v.* Ames (169 U.S. 466), page 58.

[2] Here it was stated "as a rule" that the true value of a property "efficiently located, constructed, and maintained," where the results of operations "show volume of traffic and earnings sufficient to support the property, pay reasonable dividends, and leave something in addition, is in excess of the mere cost of reproduction of the physical or tangible property."

Brief for the Companies, Minnesota Rate Cases, page 160. This "rule" was supported by a series of citations from tax, condemnation, and rate decisions, of which only three (Smyth *v.* Ames, Knoxville *v.* Knoxville Water Co., and Willcox *v.* Consolidated Gas Co.) were Supreme Court decisions. There is nothing in these cases as decided to warrant the unqualified statement of the "rule." The attorneys might have said, with equal truth, that the value (i.e., exchange value, which they apparently had in mind) bore no relation whatever to anything but earnings, realized and prospective.

See the testimony of W. L. Darling, Minnesota Rate Cases, Record (N.P.), pages 29–30; that of Howard Elliott, page 1257 and following; and of J. J. Hill, Record (G.N.), page 1290.

[3] See above, page 18, describing the "process" of the Indiana Tax Commission in fixing upon the value of the road as a whole.

> operated separately. It is the aggregate of those values plus that arising from a connected operation of the whole, and each part of the road contributes not merely the value arising from its independent operation, but its mileage proportion of that flowing from a continuous and connected operation of the whole. This is no denial of the mathematical proposition that the whole is equal to the sum of all its parts, because there is a value created by and resulting from the combined operation of all its parts as one continuous line."

And to make more certain his meaning, Justice Brewer gave the illustration of the formation of the New York Central Railroad:

> "Immediately upon the consolidation . . . the value of the property was recognized in the market as largely in excess of the aggregate of the values of the separate properties." [1]

But Justice Brewer was speaking of *market value*, and the increase in this value could only come through a realized, or anticipated, increase in net earnings, or through a change in the rate of capitalization. Indeed, his language had no connection whatever with "value" as determined by appraisal. Because of a parallel in *phraseology*, counsel have apparently attempted to correlate opinions upon quite detached subjects.[2]

"After much discussion, comparison of figures, and readjustment," the Court in the National Water Works Case fixed upon $3,000,000 as the "fair and equitable value" which should be paid by the city. This was "some-

[1] 154 U.S. 439, 444.

In Adams Express Co. *v.* Ohio (also a taxation case) Justice Brewer wrote in similar vein: "Now, whenever separate articles of tangible property are joined together, not simply by a unity of ownership, but in a unity of use, there is not infrequently developed a property, intangible though it may be, which in value exceeds the aggregate of the value of the separate pieces of tangible property." 166 U.S. 185, 219.

See A.T. & S.F. Ry. Co. *v.* Sullivan, 173 Fed. 456, 464.

[2] Brief for the Companies, Minnesota Rate Cases, pages 334–35; Brief of Burton Hanson, Evidence, 1910 Advances, page 3714; Brief of Messrs. Dunlap, Norton and Lathrop, pages 3601, 3603; and the Valuation Brief of 1915, pages 494–96.

thing in excess of the cost of reproduction" (which by appraisal had been placed at $2,714,000); but the additional $286,000 represented simply an arbitrary allowance. No reason appears in the decision to indicate why the figure was not placed above (or below) that chosen, except perhaps that $3,000,000 was the par of a bond issue.[1] That the Court had any clean-cut conception of the nature of this "value which flows from the established connections" is doubtful. The conclusion was simply that the city was to secure a property which not only had "the pledge to earn," but was "in fact earning." The argument is, then, quite typical of the reasoning on the subject of "value" found in the judicial opinions. Certainly there is nothing to indicate that Justice Brewer had in mind what may be called the "cost of production" of a "going business." [2]

Nor has there been unanimity among the "experts," or even clarity, either, for that matter. What could be more noncommittal than the assertion that "going value" included "practically all the elements of value which the company may possess outside of its actual structural value, and the tangible worth of value of its quick assets"? This product of a "very wide expert experience" impressed the New Jersey Commission with its "solidity." [3] Or there is the definition of M. E. Cooley, who speaks of "the value lying in the property by virtue of its kinetic or dynamic character, as distinguished from the value in the property by virtue of its potential or static character." [4] One is forced to the opinion that the idea of value as something independent of earnings is by no means confined to the members of the legal profession.

The method of measurement (other than the "compara-

[1] National Water Works Co. *v.* Kansas City, 62 Fed. 853, 866.

[2] *Ibid.*, page 865.

[3] *In re* Rates, Public Service Gas Co., 1 N.J.B.P.U.C. 433, 477. This definition had been asked for "as a definition."

[4] Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 151. Professor Cooley appeared as an "expert" witness for the company.

tive plant" method) proposed by the "experts," has generally been the safe method (safe, since devoid of principle) of measuring the allowance for the "going concern" in terms of a percentage of the "value" of the plant as determined by appraisal.[1] For the present purpose it is sufficient to cite a single instance. In one Wisconsin Commission case, the two experts for the company placed this figure, one at ten per cent, the other at twenty per cent.[2] Had another set of experts been at hand the figures could have been placed at fifteen per cent[3] — at thirty per cent; even at one third the "structural value."[4] Resort to such rough approximation (based on no logical relationship) can hardly set claim to being a serious contribution to the problem of regulation.[5]

IV

The Wisconsin Commission has, however, invoked what it has called a doctrine of "cost," having as a major premise the assumption that the company in the public service is "entitled" to the same "fair return" from the

[1] The failure of the Minnesota Master to deduct "depreciation" was justified in part on the grounds of "adaptation to the needs of the country," "knowledge derived from experience," and "readiness to serve," marking his acceptance of testimony of J. J. Hill, Minnesota Rate Cases, Record (G.N.), page 1299; of Howard Elliott, Record (N.P.), page 1249. See Minnesota Rate Cases, 230 U.S. 352, 457–58.

[2] Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 157.

[3] Knoxville *v.* Knoxville Water Co., 212 U.S. 1, Record, page 2137. Here the president of the company attempted to justify the figure of fifteen per cent which rested "very largely" on his judgment, as a "single, convenient . . . conservative basis."

[4] See State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 571, an amusing comment on the testimony of President Humphreys, of Stevens Institute, who testified as an "expert." He testified with equal vagueness, but in a positive tone, in the New York Gas Case, Record, pages 1688–89, Willcox *v.* Consolidated Gas Co., 212 U.S. 19.

[5] In Pioneer T. & T. Co. *v.* Westenhaver, the Oklahoma Supreme Court accepted one of these expert "opinions," which was "not contradicted by the State." 118 Pacific 354, 361.

beginning of its operations. The general experience of new enterprises shows during the preliminary years of operation a return less than the normal going rate on investments in established enterprises. Does not the sum of these "deficits" measure "the cost of building up the business"? [1] The Wisconsin Commission has so assumed; and this "continuous property" theory is one of the working tools of that body, its use now justified by reference to precedent.[2] Professor J. R. Commons, appearing before the Senate Committee working upon the Valuation Bill, could testify at length in its favor.[3]

The same general line of thought is found in Commissioner Lane's opinion in the Western Advance Case of 1910, where he broke from the "rule" in Smyth *v.* Ames, which Commissioner Prouty used as the guide for his discussion in the Eastern Case. In summing up, Mr. Lane said:

"The nearest approximation to the fair standard is that of *bona fide* investment — the sacrifice made by the owners of the property — considering as part of the investment *any shortage of return* that there may be *in the early years of the enterprise.* Upon this, taking the life history of the road through a number of years, its promoters are entitled to a reasonable return." [4]

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[1] See Metropolitan Trust Co. *v.* H. & T.C.R. Co., 90 Fed. 683, 687, possibly the original source of inspiration.

[2] This doctrine was first clearly expressed in Hill *v.* Antigo Water Co., 3 W.R.C.R. 623, 711 (1909). See Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 122, and cases there cited. In Spring Valley W.W. *v.* San Francisco, 124 Fed. 574 (1903), a similar calculation had been introduced by the company, page 577; also, 165 Fed. 667, 696; 192 Fed. 137, 166.

[3] *Senate Report on Valuation*, pages 94 and 99. See testimony of B. H. Meyer, before the House Committee, *ibid.*, pages 225 and 228.

[4] Western Advance Case of 1910, 20 I.C.C. 307, 347. The italics are the writer's.

The Antigo Case, though not referred to by Commissioner Lane, was cited in the Brief of Messrs. Dunlap, Norton and Lathrop for the Santa Fé. Evidence, 1910 Advances, pages 3567, 3609. The attorneys for the State in the Minnesota Rate Cases, seeking to throw discredit on the "cost of reproduction," quoted the passage in Commissioner Lane's opinion. Brief for the State, page 80.

The Atchison, Topeka and Santa Fé was the only carrier which presented figures purporting to measure this "shortage of return." The late Mr. James Peabody, the company's Statistician, testified that since 1896, when the company was reorganized, this amount had grown to $154,568,319.69. These figures had been worked out by his chief clerk in "two or three hours," and were introduced under the formidable caption, "account current of the A.T. & S.F. Ry. Co. with the public on the basis of 6 per cent return on the property investment." [1] Since this table was presented with all the completeness of a "cost of reproduction" estimate, it is worth while to indicate the process by which the pretentiously accurate total was determined.

The calculations began with the "property investment of January 1, 1896," as shown on the books of the reorganized corporation. This original figure was $371,669,326.78. To this was added one half of the cost of the additions made during the first six months of operation, procedure entailed because of the non-coincidence of calendar and fiscal year. The total was a "mean investment" of $371,886,794.77. Three per cent of this total was $11,156,603.84; the "income available for return on investment" was only $2,432,870.06. Therefore a "deficiency in return to be carried to investment" appeared of $8,723,733.78. The "total investment at the end of fiscal year" was consequently the sum of this "deficit," the original "total investment," and the total cost of additions. To this amount was added one half the cost of improvements made in the next fiscal year, etc., and the train of calculations was duly concluded to 1911. A series of "deficits" resulted, ranging from nearly five million dollars, in the boom year, 1906–07, to seventeen millions in the first full year of operation (1896–97). Even in 1910 the

[1] Evidence, 1910 Advances, pages 1107, 1108, 1098, 5563, Exhibit No. 26-8.

amount ran above ten millions. Over the period of years "the deficiency in return to be carried to investment" amounted to the exact total which was presented to the Commission — $154,568,319.69.[1]

The first concern is with the statistical adequacy of this calculation. It began with an item, the Investment account of the reorganized company, which, if not in some degree fictitious, was of uncertain validity. To balance the increased par of securities, it had been "written up" some $40,000,000 without any additions to physical assets.[2] How much or how little the total represented "water" before that time is entirely conjectural.

In the second place, had the income been accurately stated during the period; was the property being "milked"; or, what is more probably true, were net additions being made out of earnings? If so, to what extent had the "squeezing-out" process been operative in any one year? These questions obviously cannot now be answered. Yet on the basis of figures which were, on this ground, quite inconclusive, an "account current" against the public was drawn up, which one of the foremost railroad statisticians of the country declared "was made out in harmony" with his views.[3] The truth is simply that the

[1] Evidence, 1910 Advances, pages 1098, 5563.

Mr. Peabody here spoke of this as the amount "that the public owe the Santa Fé road on the basis of six per cent return on property investment;" the Brief for the company, as the "absolute inadequacy of earnings," page 3567.

The detailed method used by the Wisconsin Commission is described in full in State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 580. The same general hypotheses are there used, as those assumed by Mr. Peabody.

[2] See the detailed discussion of Santa Fé accounting methods prior to the administration of President Ripley, W. M. Cole, *Accounts*, page 196. Mr. Peabody testified that he made "no analysis of the original amount whatever," Evidence, 1910 Advances, page 1107.

[3] Evidence, 1910 Advances, page 1107. Nor have the computations made by the Wisconsin Commission been more scientific. Rejecting book accounts and reverting to the meaningless "average price" appraisal, it has never-

computation is an example of worthless statistical procedure.

An equally compelling criticism can be brought against the validity of another of the premises. Why should the rate of six per cent be used instead of eight, or nine, or ten per cent? [1] The rate of six per cent may have represented simply gravitation to a rate, which, at least, in the public mind, bears the earmarks of "fairness." At all events, the Wisconsin Commission's computations have usually been based upon higher rates, seven and seven and a half per cent, not infrequently eight.[2]

That in a business involving a greater or less degree of risk (the extent of risk is not our present concern) such rates might well not be excessive may be granted at once.[3] But though the Wisconsin scheme as applied by the Santa Fé would not insist on payment out of hand to the stock-

theless used these same accounts in order to measure the "cost of building up the business." And the totals, like those of Mr. Peabody, have been presented as though accurate to the final cent. See Milwaukee *v.* M.E.R. & L. Co., 10 W.R.C.R. 1, 151; and cases cited at page 123.

Though Mr. Peabody assumed sole responsibility for his figures, it would seem that G. O. May, an accountant who testified for the Santa Fé, may have been the one suggesting the compilation of the table. Evidence, 1910 Advances, page 1052.

[1] "Mr. Peabody. . . . The public owe the Santa Fé Road . . . $154,568,319.69.

"Mr. Norton. And that amount would be much larger if it was computed at eight or nine or ten per cent?

"Mr. Peabody. If it was a larger per cent, the amount would be very much larger."

Evidence, 1910 Advances, page 1098.

[2] In the Antigo Case, which was the precedent to which the Santa Fé attorneys looked, one set of calculations was made on the six per cent basis; another set on the seven per cent basis. 3 W.R.C.R. 623, 744–50. See *In re* Menominee & Marinette L. & T. Co., 3 W.R.C.R. 778, 792; State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 577; City of Appleton *v.* Appleton W.W. Co., 5 W.R.C.R. 215, 276; Cunningham *et al. v.* Chippewa Falls W. & L. Co., 5 W.R.C.R. 302, 315.

[3] It should be noted that where a portion of the funds invested are secured by bonds bearing a lower rate than the rate on which the calculations are made, the result is to increase the rate of return on the investment by shareholders.

holders of fifteen years ago, it would, in substance, permit them (or the persons to whom they have sold) to consider the "deficits" as investment. In other words, these stockholders are placed in exactly the same position as the investor whose enterprise began as an immediate success, who received dividends, made savings, and reinvested in this or in another enterprise.[1] The compounding of annual "deficits" perhaps stops short of a formal guarantee of return to the company. But in effect one risk element is removed: there can be no legislation affecting rates unless previous "deficits" are included as "investment."

A corollary of the proposal to "capitalize the deficit" says: "the surplus should be deducted." This, at least, is the doctrine to which Professor Commons subscribed.[2] The issue was raised in the Spokane Case. The counsel for the city insisted that the "physical value" should be reduced by the amount of the accumulated surplus. In the face of the dividends paid, its existence indicated, they declared, that excessive rates had been charged. The railroad is an agent of the Government, and as such is entitled only to "reasonable compensation." This the dividends had constituted. Therefore the surplus represented exploitation, and its amount should be conceived of as a fund held by the railroad as trustee for the public. So ran the indictment and the argument. In refusing to approve this

[1] The fact that a former holder made this "investment" (entirely unconsciously since the *Antigo* scheme is a modern invention) does not change the character of this conclusion. On the contrary, the former holder sold, and bore the loss, the present holder purchasing for the income of the future. To him the bonus accrues as a gratuity. But if the fact that "deficits" were incurred under other than present owners, and borne by them, is to constitute a bar to such allowance, because the "deficits" have "been wiped out in the various transfers of ownership," the claim would seem in a precarious state. See State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 586, where the point is raised.

[2] *Senate Report on Valuation*, pages 100, 130, where the phrases quoted appear; also pages 127–30.

reasoning the Commission indicated points of insufficiency. In the first place the Government had supplied no absolute test of a reasonable rate; in the second place, accumulation of a surplus by a particular road might be accounted for by reason of "cheaper construction and easier operation." [1] The fact that the company had the choice of distributing the income to its owners as dividends, but instead chose to add to its plant (in short, forced the shareholders to add to their investment in the railroad, rather than allowing them to invest elsewhere), the opinion did not consider; though this, it would seem, should be the vital issue. That the "saving" had been done by a corporation, rather than by individuals, should not hide the economic significance of the omission to distribute the volume of earnings. The risk was assumed; the venture proved profitable; part of the earnings were put back into the property.[2] Certainly to

[1] Spokane *v.* N.P. Ry. Co., 15 I.C.C. 376, 410, 415. See Commissioner Lane's discussion in the Western Advance Case of 1910, 20 I.C.C. 307. The arguments of the attorneys for the city of Spokane were similar to those used by E. B. Whitney in Willcox *v.* Consolidated Gas Co., 212 U.S. 19. Mr. Whitney's Brief reads as follows: "Properties purchased out of surplus earnings, over and above high dividends, the facts not being disclosed to the consumer, should be regarded as having been contributed by the consumer, and not by the company, and hence should not be treated as capital for the purpose of fixing rates" (page 244). This reasoning is called "socialistic" by J. M. Beck, in his Brief (page 100), though Mr. Whitney in his reply insisted that to hide "further profits which the public does not know that it is making, by paying them out in what the public believe to be operating expenses, but which are really additional construction, the purpose of the whole thing being to prevent the public from knowing how much money the company is really making, and then capitalize this additional construction against the public, and collect tolls thereon for the rest of eternity" meant "the permanent capitalization of an original fraud" (pages 47–48).

See Evidence, 1910 Advances, page 4338, Argument of L. D. Brandeis; and page 5288, that of Walker D. Hines in reply; where both men assert that high earnings do not necessarily indicate "excessive rates."

[2] This problem has never come to the Supreme Court as an issue. In Louisiana Railroad Commission *v.* Cumberland T. & T. Co., 212 U.S. 414, 425, Justice Peckham, though discussing the property presumably representing reinvestment of the charges to depreciation, indicated that the Court was not "considering a case where there are surplus earnings

declare at this time that the "surplus" accumulated in the past represents extortion, and that extensions, etc., in effect offset on the balance-sheet by the "surplus," should not be considered as investment by the company for the benefit of its owners, but instead as a "trust fund" for the public, involves a very real regulation (confiscation?) of "past profits." The company which has conserved its resources would be penalized for careful management. But if the successful railroad shall keep the fruits of its extraordinary gains, the unsuccessful must expect to bear its losses. Such consistent application of the reasoning has not, however, been required by the attorneys for the railroads. The one has insisted that the past "losses" should in effect be capitalized. His colleague, representing another interest, has vigorously protested against a deduction on account of earnings made in excess of a "fair return." "Heads we win, but tails, you lose." [1] And all this, be it remembered, assumes that the surplus is real.

It is easy enough to reduce to an absurdity the programme which would conceive of "deficits" as "investment." The more unsuccessful a project has been, the greater has been "the cost of building up the business";

after providing for a depreciation fund, and the surplus is invested in extensions and additions." That problem could be dealt with as it might arise. See also Whitten, *Valuation of Public Service Corporations*, page 176 and cases cited. Mr. Whitten writes: "If a company has charged rates, not alone adequate to pay a fair and reasonable profit to the stockholders, . . . but also to permit the building out of earnings of extensions, there is some justice in the argument that unless this has been done for the benefit of consumers it represents pure extortion."

See the Valuation Brief of 1915, pages 472–78.

[1] Brief of Messrs. Dunlap, Norton and Lathrop, for the Santa Fé, Evidence, 1910 Advances, page 3609; that of C. M. Dawes for the C.B. & Q., page 3634; that of E. M. Hyzer for the C. & N. W., pages 3751–54; and argument of Walker D. Hines, page 5289.

The Wisconsin Commission, when a "negative" figure would develop, has been content to indicate that no "going value" should be allowed. See State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 582, 583. Clearly this is a failure to face the logical issue.

the greater is its "value" as a going concern. A protracted preliminary deficit might, in the long run, be as substantial a goal for efficient management (in the sense that the test of management is the securing of returns for the owners) as an unbroken record of dividend payments, or the creation of a surplus. But Commissioner Lane qualified his approval of the doctrine that a "shortage of return" be considered as "*bona fide* investment." Such conclusion "manifestly" is limited; for a return should not be given upon wastefulness, mismanagement, or poor judgment.[1] The Wisconsin Commission has held that "deficits due to abnormal conditions, bad management, poor judgment, extravagance, lack of ordinary care and foresight . . . should receive very little attention." [2] Professor Commons insisted that "the deficit must be reasonable." [3]

These qualifications are obviously more plausible than capable of practical use. They assume the existence of a "representative firm" with "reasonable" and honest direction. But what test shall be applied to determine "slipshod, careless, unprogressive management" of a generation ago; what of "competition"; "the collapse of the boom"? [4] The one convincing test is the very ability or inability of the venture to net its owners the normal return which might have accrued from investment in another direction, assuming that its operations have not been squeezed or irrationally hampered by restrictive legislation.

Whether in condemnation proceedings, after the investor has borne a deprivation of income accruing during the

[1] Western Advance Case of 1910, 20 I.C.C. 307, 347.

[2] State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 586, also Superior Commercial Club *v.* Superior W.L. & P. Co., 10 W.R.C.R. 704, 742.

[3] *Senate Report on Valuation*, page 95.

[4] See Application Oconto City Water Co., 7 W.R.C.R. 497, 516; Application La Crosse G. & E. Co., 8 W.R.C.R. 138, 184; Superior Commercial Club *v.* Superior W.L. & P. Co., 10 W.R.C.R. 704, 742; in which these points are raised.

first years of operation, allowance might not equitably be made for "deficits" presents entirely different considerations from those which are presented when rates of charge are concerned. Condemnation deprives the enterprise of the power to make such profits through a period of years as had been contemplated when the investment was first made. There can be valid reason for the allowance in the one case, and not in the other. Rate regulation does not contemplate taking the property from the owner. What is a "fair return" depends upon the risk assumed, and the degree of skill and judgment exercised in planning the enterprise. The normal return must accrue in the "representative case" — the case, indeed, where it would seem the Wisconsin Commission and Mr. Lane have sought to apply the "deficit" theory.

The fundamental error of principle in the Wisconsin doctrine is that it seeks to measure an "investment," not in terms of "saving," of effort, of sacrifice, but by results. It has been insisted that "going value," as calculated on the "deficit" plan, is a "true cost"; that "it is a true investment on the part of the owners" — "an investment in the sense that the company might have invested its money in other business which would have given it a fair rate of return." [1] Passing over this matter of fact assumption of a *justum pretium* assured to investors outside of the railroad business (how this insurance operates is left unsaid), does the sense here attached to the word

[1] J. R. Commons, *Senate Report on Valuation*, page 94: "Now, notice that this involves the addition of an intangible value, not based on future earning power like a franchise or good-will, but based on a past investment or cost, as compared with other investments; that is, not only what they actually paid for cost of construction is investment, but the income they could have secured, but did not secure, in comparison with others who received a fair return, is also a cost, and therefore an investment."

This, like the passage quoted in the text, overlooks entirely the risk-assuming function.

"investment" accord with economic usage, or current economic reasoning? Investment requires saving, the putting aside of income, and its subsequent use in production. Is any saving involved in the "deficit" theory? On the contrary, it would measure investment in terms of a failure to earn, in terms of a failure to provide a source of investment. No choice of spending or saving appears. There is only assumption of investment, with nothing to invest; of sacrifice, with nothing to forego. The hardship outlined by referring to an assured "fair return" (whatever that may mean) from investment in another direction which did not accrue from the investment in a railroad is not real. There is no assurance in any business of a "fair" (meaning here a "normal," or "representative") return. Risks are assumed, with the expectation that in the long run the return received will compensate the investor. There are failures, as well as successes, in any line of business activity. The railroad, or the local public service corporation, offers here no peculiar economic characteristics.

Thus the Wisconsin Commission has run far afield from a cost of producing "going value." Analyzed in these terms, the scheme which received the approval of Commissioner Lane is seen to have passed over the point in controversy. The "supply price" of business relations cannot be measured by past "deficits," which are dependent upon earnings, and can have no logical place in the measurement of the reasonableness of the return. The period during which effort is expended (and funds diverted) toward the creation of these relations may in large measure coincide with an early "starvation period." But by no means necessarily. And it is also true that the source of earnings aptly termed "business organization and connection" [1] is built up by all firms alike. The venture which has surpassed the "representative" mark, and the venture which has failed to reach that mark, have

[1] Alfred Marshall, *Principles of Economics*, page 625.

both met these costs. "Going value" is not confined to the enterprise which can point to "representative" management. But how shall it be measured?

V

No case better illustrates the uncertainty with which the "going value" problem has been treated than the decision of the New Jersey Commissioners in the Public Service Gas Case. They first accepted the testimony of an "expert" who, hesitating "to name an exact figure for an intangible figure of this kind," was finally prevailed upon to place the "going value" at thirty per cent of the "structural value." The actual allowance made, however, was $1,025,000, the "approximate average" of $1,102,789 (the thirty per cent), and $950,000.[1] This $950,000 was "the medium" of the "upper and lower estimates" of another "expert." The latter was understood to define "going concern value" as "what a property would fetch from a buyer in excess of the cost of the physical property." His calculation assumed that "such a concern could be financed by five per cent bonds, selling at 90, whose interest would be two thirds of the anticipated earnings." The remaining capitalization would be represented by stock bearing ten per cent. The excess of capitalization over the cost of the physical plant gave "going concern value" of between $900,000 and $1,000,000. So, when the Commission took the "medium" of these "higher and lower estimates," $950,000, and secured an arithmetical average of this amount and the "thirty per cent" guess, $1,025,000 was fixed as a "fair value." [2]

[1] *In re* Rates Public Service Gas Co., 1 N.J.B.P.U.C. 433, 476, 478, 479.

[2] The New Jersey Court of Errors and Appeals, in Public Service Gas Co. *v.* Board of Public Utility Commissioners, 92 Atlantic 606, upheld this "quotient method." "Findings of this character by juries are so common" (page 608).

But the Commission did not intend to imply that this figure was meant to cover "bond discount," which, as a mere adjustment of the rate of interest, can have no legitimate place in an appraisal of "investment." [1] The convenient figures were, it would seem, adopted without critical analysis of their validity. The aim of the Commission was simply to make a bulk allowance to cover a series of unrelated elements, which were called to its attention by the company "experts." Not only were items included which we have already indicated as claiming no place in "fair value": depreciation unearned, and the "dearth of adequate returns"; but also "the cost of soliciting business, the cost of advertising, the cost of inducing customers to take the service, the cost of exhibiting appliances, the cost of occasional free installation." [2] So, though an "average" calculation was resorted to in order to fix upon a "going value," it was not in fact assumed that bond discount was to be measured.

The case was appealed to the New Jersey Supreme Court, and the elements which the Court approved as properly allowed in "going value" were substantially those recognized by the Commission. Interest during construction and "deficits" below the "fair return" were first cited; "the obsolescence of the plant apart from that calculable depreciation which may be charged to currrent expenses instead of being capitalized; the expense that

[1] See Whitten, *Valuation of Public Service Corporations*, chapter XIII, page 268 and following, especially pages 281–82, indicating the contradictory and illogical treatment of the subject by the Wisconsin Commission.

[2] *In re* Rates Public Service Gas Co., 1 N.J.B.P.U.C. 433, 469. These elements of "going value" do not represent the fruits of original reasoning on the part of the Commission. In fact, they are as complete an acceptance of the pretensions of the public utility operators as is conceivable. See State Journal Printing Co. *v.* Madison G. & E. Co., 4 W.R.C.R. 501, 570, where the testimony of the same group of experts, making the same assertions, failed to receive sympathetic reception. However, the New Jersey Commission was apparently new to the ways of expert witnesses.

must attend, and the additional value that arises from the uniting of separate concerns, and the organization of a great industry with the view to economical production." [1] Then, though like the Commission, protesting that "good-will" was not to be considered, Justice Swayze added the other elements included: "The cost of securing and retaining customers, of encouraging the greater use of gas for fuel and for light by the introduction of new and improved appliances." [2]

The Court insisted that the "practical business questions," presented by this series of considerations, were different from the legal questions. The business questions concerned the mode of handling upon the books; but the legal question was "whether these items constitute a going value upon which the company is entitled to a return." To this question, the Court gave an affirmative answer. For "if by value we mean what the economists call exchange value, then a buyer would undoubtedly give more for a plant already doing a profitable business than for a plant of equal cost, capacity, and future possibilities but without the established business." [3] This argument is inconclusive when the mode of measurement and the purpose are considered. Even where an exchange value is sought, to use Justice Swayze's premise, the amounts spent for advertising, etc., would not be important. Their results, as reflected in the total earnings, would be the vital concern. But the "value" to be considered in a rate case is not an exchange value (as the opinion later indicates?). Seemingly the Court unconsciously worked into the very circle against which specific warning was given. One reason, apparently

[1] Public Service Gas Co. *v.* Board of Public Utility Commissioners, 87 Atlantic 651, 657.

[2] *Ibid.* See Justice Swayze's discussion in the *Quarterly Journal of Economics*, volume 26, pages 422–23, where the same general reasoning is found.

[3] Public Service Gas Co. *v.* Board of Public Utility Commissioners, 87 Atlantic 651, 658.

the significant reason, why the established concern (if its operations have proved *successful*) will sell for a higher price is because the degree of risk is readily ascertainable. The earnings (actual and prospective) are in larger degree capable of estimate and are capitalized at a lower rate. The new concern must face greater and unknown risks.

The series of items included in the scope of the Court's definition of "going value" are so varied, bearing no apparent relation to each other, that the same reasoning cannot be made to apply to each set of items. Obsolescence may be "capitalized" — upon what grounds? The argument for such allowance is not to be found in the Court's opinion; yet the idea is not a new one. Railroad men have contended that in the case of the abandonment of permanent structures, made necessary by "progress in the arts," the cost of the discarded property should be considered as the "cost of progress" and added to any appraisal of physical assets.[1] The instances have been cited of the Grand Central Station in New York which "involved the wiping-out of an enormous expenditure by the New York Central lines," of "abandonments along the whole line of the Pennsylvania Railroad Company," and of the Union Pacific which "General Dodge would have built . . . just where it is to-day if he had had the money to do it." [2] Or, "in the development of a railroad it not infrequently happens that a portion of the original line is abandoned.

[1] This idea seems to have been developed by W. H. Williams, of the Delaware & Hudson. At least it is ascribed to him in discussions by railroad men. See, for example, testimony of Mr. Frank Trumbull, chairman of the Board of the Chesapeake & Ohio, *Senate Report on Valuation*, page 36.

[2] Testimony of Mr. Trumbull. Mr. Trumbull was urging inclusion in the Federal Valuation Bill of the clause permitting the Commission (when the fact was deemed "pertinent") to "ascertain and report . . . the cost of property not worn out, but abandoned to aid in the development of better or more economical service to the public." *Senate Report on Valuation*, page 32. He would leave the "consideration" of property abandoned "on account of the necessity of progress" with the Commission (page 37).

The interests of the public justify the reconstruction of a certain portion of the old line reducing grades and perhaps serving new localities, and in the end the old line is abandoned." [1]

The fallacy in the contention that plant, no longer in the productive process, should be included in an appraisal rests in the failure to recognize that the abandonments have been made in the interest of the railroads, not in the interest of the public. Spending "millions and millions of dollars" in building the new Union Pacific was justified that the road "might haul freight cheaper, which would augment the net earnings." [2] If the public gained by way of improved service, that gain was quite secondary to the possibility of financial gain to the company, which from the business standpoint (and the economic) justified the improvements. The reason why the old Grand Central Station, entirely adequate in its day, was torn down and replaced by the new, was because the concentration of population and business in New York so increased the density of traffic that the volume of earnings accruing was thought to justify the change. Otherwise the scrapping of the old and the building of the new meant conscious economic waste. And the changes of line, the elimination of curvature, the lowering of grades, can only be justified by parallel reasoning. The immediate reason why General Dodge did not locate the Union Pacific in its present site

[1] G. F. Swain, the *New Haven Validation Report*, page 57. See E. P. Ripley, "The Railroads and the Public," *Atlantic Monthly*, volume 107, page 19. The following is from an earlier opinion of the Interstate Commerce Commission (In the Matter of Advances, 9 I.C.C. 382, 402), the opinion being by Commissioner Prouty: "In the development of that industry they [the railroads] have been reconstructed and improved, the first outlay has perhaps been rendered practically worthless. . . . Those who originally invested their money in this enterprise and have kept pace with the public necessities ought not to be required to bear the entire burden of this shrinkage."

[2] A frank acknowledgment by Mr. Trumbull. *Senate Report on Valuation*, page 37.

may have been lack of funds. But the funds were not forthcoming because there was general doubt whether even the low-standard line could be made to pay. The traffic possibilities, as seen, and, for a long time, as realized, of the tributary territory did not warrant greater expenditure in construction. With increase in traffic density, and necessity for longer trains to secure economical handling, elimination of curvature and lowering of the ruling grade were essential. The old line had then, in economic analysis, come into exactly the same situation as any other plant, or machinery, abandoned as unworkable.

That the grade itself does not disappear cannot hide the essential fact. The labor (and therefore the "investment") spent in building the grade, the bridge, the tunnel, has been used up. There is no longer possibility of future contribution to the productive process. The grading of a railroad is simply a specialized case of "capital sunk in the soil." When it ceases to be workable, the investment has been used up. One of two things has happened: either the earnings of the plant as a whole have included a return of the investment originally made in the plant now abandoned, or a risk of the business has materialized. No other conclusion is, it is submitted, tenable. "A more complete depreciation than that which is represented by a part of the original plant that through destruction or obsolescence has actually perished as useful property, it would be difficult to imagine." [1]

The difficulty brought up by the inclusion of "the expense that must attend, and the additional value that arises from the uniting of separate concerns," raises again a point already indicated. Seemingly, in spite of the mention of "expense," the Court did not have in mind the cost of bringing about the consolidation, including in "cost" such reward as might be *necessary* to stimulate the incep-

[1] Kansas City Southern Ry. Co. *v.* U.S., 231 U.S. 423, 448.

tion and completion of the consolidation. The evidence for this conclusion is in another passage of the opinion:

> "We think the counsel for the company right in their contention that the value of an assembled and united plant may be greater than the total value of the separate parts. The examples given of the increased value of the New York Central Railroad over the value of its consitutent parts, Cleveland, etc. Ry. Co. *v.* Backus, . . . suffice to illustrate the difference between the value of a whole plant, and the value of its parts. The advantage of large scale production over small scale at several plants is too well known to require more than mention, and the getting together of property sufficient for the purpose no doubt may create a real value, which may be allowed for in going value." [1]

But since the advantage of large-scale production is only reflected through earnings, and therefore through *market value* ("exchange value"), the argument here reproduced is beside the point. The "expense," the "cost," but not the "additional value" can demand consideration in regulation proceedings.

Final attention turns to the proposal which would set up selling costs as "investment." Here, though the conclusion of the Commission and of the New Jersey Court cannot be accepted, a possible analysis of the problem is suggested by the argument, which must itself be rejected. The Court understood the Commission to have intended that the bulk allowance for "going value" should cover *all* costs of soliciting business, and attracting new customers. "No doubt fair-minded men may differ," said Justice Swayze, "but as the Commission seems to have allowed the actual expenses proved, and permitted the whole to be capitalized, even when paid out as current expenses from current rates . . . no injustice was done in this respect" (i.e., to the company).[2]

[1] Public Service Gas Co. *v.* Board of Public Utility Commissioners, 87 Atlantic 651, 658.

[2] *Ibid.*

Indeed, in order to avoid "injustice," the company was, in substance, permitted to capitalize against the public certain parts of the cost of its products furnished in the past. The difficulty which led to the confusion arose because the customer secured by the initial expenditure, in the general run of cases, continued to be a purchaser of service (in the New Jersey Case, gas,) through a long period of years. The expense of attaching the customer to the business was incurred once for all at the beginning. Business practice had not set up any part of this first cost as a "deferred asset," presumably aiming in the interest of conservatism to overstate rather than run the risk of understating current operating expenses. But, from the point of view of economic analysis, there is no reason why such a "deferred asset" account might not have been set up, to measure the amount of any cost *properly spread over the future*. Such an account would not, however, measure a permanent level of "investment." It would be necessary each year to charge off a *pro rata* share. The situation is parallel with that presented by the charge against current earnings to compensate the depreciation of fixed assets.

The New Jersey Commission had not bothered with such refinements; nor did the Court. All advertising and soliciting expenses (in the case of the railroad all "traffic expenses") were, according to their doctrine, simply investment in that "property" which is in the shape of "exclusive patronage." The argument used to justify this conclusion can best be given in the Commission's own language:

> "If in the past, this company out of the rates exacted from consumers had met its operating expenses and depreciation, and in addition thereto had obtained enough to pay returns to investors and to build an actual structure used in the business, would this structure be the lawful property of the company?" [1]

[1] *In re* Rates Public Service Gas Co., 1 N.J.B.P.U.C. 433, 470.

The affirmative answer given this query is entirely in line with our own previous analysis. Now, said the Commission, suppose that the company, instead of buying plant, spends a part of its income in advertising and soliciting campaigns. Does not the company thereby "acquire an intangible property in the shape of exclusive patronage"? It was on this ground that the sums spent for soliciting were held to represent investment, "for the business thus acquired must be regarded as a legitimate part of the property of the company." [1] But the real difficulty was glossed over by the Commission. The attempt to compare the expense of distribution with amounts diverted to the purchase of new plant (the calling of both, "investment") failed to recognize that it must be entirely a matter of conjecture how much gross income would have been in the absence of such expenditures. It cannot be assumed that the amount charged to soliciting, etc., would have been available for further investment in plant had the expense of securing business been omitted. The volume of gross earnings annually accruing has been dependent in part on the amount spent for soliciting, etc., in that year.

Some part of the expense of selling the product, whether it be coal, or gas, or ton-miles, consists of the cost of making the particular sale. How much, it would be difficult, if not impossible to say. Some of the effort fails entirely of result, like the effort expended in making a machine which proves useless.[2] There may also be some very real investment. But in the absence of records, or attempt by the companies to carry such accounts, the task of "appraising" the "intangible" appears a baffling one. Even having the amount of an original entry (which might have been made),

[1] *In re* Rates Public Service Gas Co., 1 N.J.B.P.U.C. 433, 475. Yet (page 480) the Commission insisted that no consideration could be granted "good-will"!

[2] Apparently, Justice Swayze included in "going value" the cost of machines made for experiment, etc. (87 Atlantic 651, 657).

how much of this first "cost" can, at a given date, be said to remain "undepreciated"? In short, how long will the customer continue to buy service, and to what extent will the volume of his consumption expand, etc.? The measurement of the accrued depreciation in the physical plant appears as child's play compared with this.

Consider an attempt to make use of the analysis here outlined in "railroad valuation," when the competition of carriers for business is so keen over wide areas. The expense of bringing settlers to the tributary country, of securing an industry to locate along the line of the railroad, etc., might be such an expense as would be chargeable against income subsequently accruing. But, in the face of active competition, it would seem that the largest part of "traffic expenses" are not to be spread over a period of years. What would be the effect of discontinuing the solicitation of traffic cannot even be conjectured. Present solicitation, present effort to get business, is probably in largest measure chargeable against the returns from that business. That some amounts might be recognized as "costs" of securing the permanent relations may, nevertheless, be granted. But how fix upon the "undepreciated" volume of this figure of "value," within limits of accuracy useful for a standard of "reasonableness"?

The "cost of building up the organization" also demands an attempt to measure effort and sacrifice made once for all, usually in the beginning.[1] But its determina-

[1] See Argument of Burton Hanson, for the C.M. & St.P., Evidence, 1910 Advances, page 3713. Parallel language was used by the attorneys for the Companies in the Minnesota Rate Cases: "Value which is reflected by added earning power derived from the . . . possession of an efficient organization, a past record of prompt and efficient operation, giving the property and its organization a standing in the commercial communities it serves." Brief, page 159.

Henry C. Adams' appraisal of the "intangible" elements of value in Michigan, determined through capitalizing earnings, included a "value" on account of the "organization and vitality" of the railroad. Bulletin 21, Bureau of the Census, *Commercial Valuation of Railway Operating*

tion is equally elusive. Neither for "good-will" ("connected value"), nor for this "cost" of creating an organization does there seem a possibility of indicating any figures which should distinguish between expenses chargeable in the past against income from current operations, and the income from future operations. Such a differentiation must have been difficult in the past. It does not seem at all feasible now.

The present economic structure functions more effectively because effort has been expended, not in the making of machines ("capital goods") alone, but in the creation of "good-will," and of well coördinated business organizations. The costs of these efforts are the "expenses of production" of the going concern. "Going value" would seem, therefore, more properly applied to these two costs, rather than to the cost of business relations alone. The business man generally conceives of his return on such amounts, if indeed he gives them a thought, simply in terms of a higher return on the cost of his tangible assets, his investment in plant. It is a part of the return for skillful management, a part of the differential return appearing in "business profits."

Certainly data are not available for a measurement that would carry with it any assurance of reliability. The conjectural nature of the "valuation" of tangible assets has already been indicated. For an appraisal of "going value," here comprehending both "*business organization and connection*," this uncertainty is multiplied many fold. No usable solution appears possible.

Property, page 78. See *In re* Arkansas Rates, 187 Fed. 290, 319; and S. O. Dunn, *American Transportation Question*, pages 95 and 96.

CHAPTER VII

THE RETURN TO THE RAILROAD

The rate of return as considered by the Commission, 188. — By the courts, 190. — The legal rate of interest, 191. — Willcox *v.* Consolidated Gas Co., 191. — The "risk element," 192. — The incidence of a shifting price level, 194. — Railroad credit, 194. — "Unproductive" improvements, 195. — The creation of economic rent, 200. — The differential element in profits, 202. — The "unearned increment" once more, 203.

THE nature of the problems presented to the Interstate Commerce Commission, in the cases where "valuation" has been discussed as a measure of reasonableness, accounts for the uncertain and inconclusive treatment of the rate of return in those decisions. Where reductions have been in contemplation, a circumstance which, it would seem, would force a discussion of the "fair" rate of return, "valuation" has proved secondary to the considerations governing the reasonableness of the individual charge, and the removal of discrimination. In the Advance Cases, on the other hand, no affirmative stand has been required. It has been sufficient for the Commission to hold that the revenue received by the carriers under the old schedules has been inadequate.[1] In this respect, the position of the Commission has been comparable to that of the judiciary when attempting to determine whether rates have been "so unreasonably low" as to be confiscatory.

The task of determining a reasonable rate of return demands recognition, at a given moment, of forces the operation of which can be distinguished only in the long run. Though it be true that the road once built will be continued in operation while it nets but little, perhaps nothing, on

[1] See discussion above, page 2 and following, and the cases there cited.

the "fixed" investment, the prospect of the return which would be received in enterprises requiring equal assumption of risk, equal foresight in planning, equal efficiency in management, must be held out to the investor at the beginning of construction. This does not mean that the public should in effect say to every promoter of a railroad: build the line, and it will be permitted to make such charges as net the going rate of return on the investment. Though there be conspicuous successes in the railroad business, there may be here, as in other lines of economic activity, dismal failures. The risk of failure the public has not borne; instead it has left the field open to private enterprise. If the risk shall materialize, if the venture prove ill-founded, a reasonable rate of return will be less than when the venture has been wisely conceived.[1] For the rate of return must consider not alone payment for present risk, but a payment of past risks assumed; and, above all, for skill and judgment exercised. At the present moment, therefore, though risk must be compensated in the rate of return, the payment is, in largest degree, a payment for risk assumed in the past. Not the insurance element in profits, but the payment for business sagacity (or the penalty for its lack) is now the more significant factor.

[1] In the 1910 Advance Cases the Commission based its discussion upon calculations covering the situation of the Baltimore & Ohio, the New York Central, and the Pennsylvania, which were chosen as "typical" lines (Eastern Case, 20 I.C.C. 243, 274); and of the C.B. & Q. and Santa Fé in the Western Case. In the Eastern Case the roads considered were those which had been discussed in the Advance Case of 1903. (9 I.C.C. 382, 425.) The *Railway Age Gazette* in its editorial columns attacked the choice of roads taken as "typical," volume 50, page 464. Indeed the attorney for the Commission had called the C.B. & Q., "one of the best operated and most prosperous." (Evidence, 1910 Advances, page 3522.) The idea of an "average road" was advanced at various points in the hearings, however, usually by railroad men. (Evidence page 5038, W. C. Brown; page 5038, James McCrea; page 2625, Jos. Ramsey, Jr.; and page 4130, Brief for the Illinois Manufacturers Association.)

In the Five Per Cent Case, the New York Central, the Baltimore & Ohio, and the Pennsylvania were urged upon the Commission as "typical," 31 I.C.C. 350, 420.

The American railroad net was created without government guarantee. It was almost solely the product of private initiative, the roads built as competitive enterprises. The pioneer railroad (and few even of the roads most recently built have not, to some extent, been pioneers), like the pioneer settler who followed in its path, exercised no exclusive privilege. On the contrary, in order to tempt men of ability to take up these highly speculative ventures (and imagination and courage were elements in this ability), it was necessary to offer land grants, and even opportunities of making gains which, in this day of more settled industrial conditions, are sometimes looked upon as piratical. There was always the risk that the venture would fail, that population could not be attracted to the new country. From the nature of the case it was recognized that the road could not be made "to pay" at once. But the income which it was expected would accrue as the country became settled, as cities grew, etc., necessarily entered into the calculations of the investor who participated in the building of the road.[1]

So far as there has been discussion of the rate of return by the judiciary, in the fixing of the minimum level, the risk aspect has, indeed, been emphasized. This has been due in largest degree to the character of the cases presented, and to the peculiar twist given the reasoning through building

[1] Alfred Marshall, *Principles of Economics*, pages 429–30: "The early settler . . . undergoes many hardships, if not personal dangers; and perhaps he runs some risk that the land may turn out badly, and that he may have to abandon his improvements. On the other hand his venture may turn out well; the flow of population may trend his way, and the value of his land may soon give as large a surplus over the normal remuneration of his outlay on it as the fishermen's haul does when they come home with their boat full. But in this there is no surplus above the rewards needed for his venture. He has engaged in a risky business which was open to all, and his energy and good fortune have given him an exceptionally high reward: any one else might have taken the same chance as he did. Thus the income which he expects the land to yield in the future enters into the calculations of the settler, and adds to the motives which determine his action when in doubt as to how far to carry his enterprise."

on judicial *dicta* in opinions subsequent to the opinion of the Supreme Court in the New York Gas Case. The lower court, fixing upon the rate of six per cent, the legal rate in New York, had made careful reservation that this was done, not because six per cent happened "to be the interest rate by law," but because it was "the return ordinarily sought and obtained on investments of that degree of safety." [1] When the case came to the Supreme Court, Justice Peckham in substance accepted the doctrine of the lower court: "There is no particular rate of compensation which must in all cases and in all parts of the country be regarded as sufficient for capital invested in business enterprises. Such compensation must depend greatly upon circumstances and locality . . . the amount of risk . . . other matters might also be properly taken into account." The opinion, however, did not point out what might constitute such "other matters." Investment in the gas business in New York representing a minimum of risk, it was held that the company was "entitled to six per cent upon the total value of the property." [2]

This is the most explicit definition of the amount of a "non-confiscatory" return given by the Supreme Court. But, if six per cent constituted the lowest limit in the case of "the most favorably situated gas business in America," the lower courts possessed a bench-mark from which to measure. Accordingly seven, seven and a half, and even

[1] 157 Fed. 849, 870. The Master had used six per cent, because it was the legal rate. Report of A. H. Masten, page 255, Willcox *v.* Consolidated Gas Co., 212 U.S. 19.

The legal rate was established as a minimum in: L. & N. R.R. Co. *v.* Brown, 123 Fed. 946, 951; Pennsylvania Railroad *v.* Philadelphia County, 220 Pa. 100, 115; Central of Georgia Ry. Co. *v.* Railroad Commission of Alabama, 161 Fed. 925, 996; Western Railway of Alabama *v.* Railroad Commission of Alabama, 197 Fed. 954.

It was attacked as too low (to be reasonable) in the Brief of Messrs. Dunlap, Norton and Lathrop for the Santa Fé. Evidence, 1910 Advances, page 3579.

[2] Willcox *v.* Consolidated Gas Co., 212 U.S. 19, 48–50.

eight per cent [1] have been established as the line between a "confiscatory" return to a railroad, and one "not so unreasonably low." And the factors which make for greater risk in the railroad business than in that of furnishing gas to New York City have, on the whole, been treated with insight. The possibility of invasion of territory by competitors, and the position which the railroad occupies in relation to general business and crop conditions, especially in an agricultural community, were emphasized in the Arkansas Case.[2] Judge Sanborn, in the Minnesota Case, also indicated the dependence of the railroad prosperity upon crop conditions.[3] One of the Alabama Masters went so far as to declare that railroad dividends are "subject to all the disasters of trade and to none of its extraordinary profits," [4] happily, an obvious exaggeration.

In the Minnesota Rate Cases,[5] much was made of the obligation of the railroad to operate even in the face of

[1] St. L. & S.F. Ry. Co. *v.* Hadley (Missouri Case), 168 Fed. 317, 354 (6 per cent); *In re* Arkansas Rates, 187 Fed. 290, 347 (7½ per cent); L. & N. R.R. Co. *v.* Railroad Commission of Alabama, 197 Fed. 954, 958 (8 per cent); Shepard *v.* N.P. Ry. Co. (Minnesota Case), 184 Fed. 765, 815 (7 per cent).

[2] *In re* Arkansas Rates, 187 Fed. 290, 346–47: See testimony of J. J. Hill, Minnesota Rate Cases, Record (G.N.), pages 1342–43, and 1320–23.

[3] Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 815.

[4] "Railroad business is confessedly more than an ordinarily risky one. The roads seldom have escaped receiverships and bankruptcy proceedings. The business is subject to the seasons, to wars, panics, pestilences, quarantines, and the general prosperity of the country." Report of W. A. Gunter, Special Master, South & North Alabama Case, page 84. To the same effect, see Western Railway of Alabama *v.* Railroad Commission of Alabama, 197 Fed. 954, 959.

[5] Judge Sanborn's discussion at pages 815–16 of his opinion, 184 Fed. 765, simply paraphrases testimony of J. J. Hill, Record (G.N.), pages 1319 and 1341–42. The rate which he approved (seven per cent) had been suggested by C. F. Staples, a member of the Minnesota Railroad & Warehouse Commission, as a minimum for the "best and most favorably situated railroad." The railroads on appeal to the Supreme Court by the State urged that a rate of return to be "reasonably adequate must be higher than seven per cent." Brief for the Companies, page 828 and following, Minnesota Rate Cases, 230 U.S. 352.

failure to make a "profit" — a phrase not defined. Investment in a factory, for example, was "substantially free from regulation by the Government and exempt from any obligation to the public, except that of paying taxes. If the business in which such an investment is made is unprofitable, its owners may promptly discontinue its operation until more prosperous days come and then return to their undertaking." Not so the poor railroad: "Its owners owe the duty to the governments and to the public to operate their railroad continually in days when its operation is unprofitable as well as when it is remunerative, a duty they must discharge under the penalty of the forfeiture of their property if they fail." [1] The extent of the burden which the Court saw placed upon the carrier is exaggerated. Only if the return received from operation is less than the cost of operating and maintaining the roadbed is there any hardship imposed by reason of the public calling. If a company is ready to forfeit its charter it has the privilege of stopping operations entirely. For a time it may be necessary to operate at actual operating expense greater than the income. During such a period the railroad's public obligation may actually constitute a hardship. But the same possibility is faced by any industrial enterprise which employs a large fixed capital and which seeks to keep its working force together. Its plant will not close down so long as the product can be marketed at a price which covers the prime cost and contributes something to the overhead charges, including interest on the investment. Thus the necessity to operate for less than "full" cost does not, of itself, exist as a burden present only in the railroad business. The public obligation simply enforces operation which economic interest would impel,

[1] Shepard *v.* N.P. Ry. Co., 184 Fed. 765, 815. Here as elsewhere Judge Sanborn followed Mr. Hill's testimony. The same "burden" resting upon the railroad was the subject of sympathetic comment by Justice Brewer in Ames *v.* Union Pacific, 64 Fed. 165, 177.

so long as operating and maintenance charges were met. To conjure up a show of great risk on this account is therefore not convincing.

Extremely intricate considerations are imposed by the phenomenon of a changing price level. A change in this level affects the railroad, and therefore the railroad owner, in twofold fashion. A rising course of prices means a mounting cost of operation, imperiling the ability of the railroad to maintain an established rate of dividend, without considerable increase in the volume of business. If the reverse process sets in, larger dividend payments may be made. In the second place, the same rate of dividend means, when prices are advancing, that the actual purchasing power of the security-holder's income has grown less. In the period of falling prices, the same rate means a greater purchasing power, a larger "real income." Where, as in the course of the first years of the present century, a rising level of prices has been accompanied by a rise in the rate of interest, a further complication is added. The burden in the case of long-term securities has been shifted to the bondholders; but, where new issues have been put out, either to refund old issues or to pay for new plant, the result has been to imperil, or at least to threaten, the safety of railroad securities. Failure to correlate these various aspects of the complicated economic problem has, it would seem, weakened the presentation of the railroad pleas for advances.[1]

These have usually been handled by lawyers, or by executives who, for the most part, have been operating and financial officers. Their plea has consistently been that "railroad credit" was endangered, and not that the railroad security-holder was bearing a burden which should be

[1] Were the reverse process to ensue, and were the rate of interest and the general level of prices and wages to fall, the opposite aspects of these same considerations would demand careful investigation. It is enough now simply to indicate the intricacy of the issues involved.

shared by the whole railroad-using public. But the fundamental question of *justice* would seem to concern the security-holder. In the 1910 Advance Cases the relationship of the "high cost of living" to the problem was barely mentioned.[1] The emphasis was upon the rate of income necessary to induce new investors to furnish funds, not upon the rate of income which should reward those investors who had previously borne risks, etc. And when the parties most interested have failed to present perhaps the strongest argument for their contention, it is easier to explain the unsatisfactory treatment of the problem in the decisions of the Interstate Commerce Commission.[2]

The same general emphasis upon "credit" led to the reference to certain classes of capital expenditures as "unproductive," by the Commission as well as by the railroad representatives. The narrowing margin between fixed charges and the amount available for distribution in dividends has not been due to the rise in the general level of prices and wages alone. The expanding volume of traffic which has sought transportation has meant the crowding of existing facilities to the point of requiring double tracking, larger yards, heavier equipment, etc.

Though "increasing returns" accrue during the period in which business is "growing up" to the plant (the phenomenon is analogous to the increase of urban site rent), a point is ultimately reached where there is a neces-

[1] Testimony of President McCrea, of the Pennsylvania, Evidence, 1910 Advances, pages 2340–41.

[2] See the Eastern Advance Case of 1910, 20 I.C.C. 243, 286–304; Commissioner Prouty's discussion of the Baltimore & Ohio, the New York Central, and the Pennsylvania; and the testimony of President McCrea, Evidence, pages 2329, 2337; of President Ripley, page 86.

Commissioner Daniels' dissent in the Five Per Cent Case, though recognizing that the "rise in price level must eventually be reckoned with in railroading," did not turn to the relationship between the rate of return and the "real income" of the security-holder, 31 I.C.C. 350, 454. Confusion of the temporary with the "long-run" rate of interest is reflected in Chairman Harlan's dissent in the Supplemental Case, 32 I.C.C. 325, 336.

sity for extending facilities.[1] Take this "practical example": The business handled over the Central Pacific between Reno, Nevada, and Sacramento, — a piece of line with heavy grades and costly construction, where double-tracking would require "a large outlay," — increased between 1896 and 1907 to the crowding point. (In fact, testimony before the Commission was to the effect that additional traffic beyond the 1907 mark would have been at the expense of economical management.) Now assume "that the Southern Pacific had begun in 1907 to double-track this piece of road and had completed the work in 1910 at an expense of $100,000 a mile. The amount of traffic would not have materially increased. The cost of maintaining the road would be greater. The cost of operation would perhaps be somewhat less, since the business could be handled to better advantage. The net result would be practically the same, but the cost of the plant would have been increased by an amount requiring on a four per cent basis additional earnings of $4000 a mile." Commissioner Prouty, in the Eastern Advance Case of 1910, drew the conclusion from this discussion (in terms of "there is some reason to believe") that the railroads in Official Classification territory were probably in the same condition as the Central Pacific line of the Southern Pacific. A point of diminishing returns had been reached after twelve years of "rapid and constant development of business. The business of 1907 was, in fact, handled, but not in a way satisfactory to the public." [2]

Other factors which slow down the tendency to the increase of returns are less directly, though hardly less surely, related to increase in traffic. They depend rather upon the increased density of population making necessary certain classes of improvements which do not immediately afford additional net revenue either through increasing gross

[1] See F. W. Taussig, *Principles of Economics*, volume 2, page 367.
[2] 20 I.C.C. 243, 282–83.

income or decreasing operating expenses. But that these improvements are made only in those centers of population which afford large traffic, both passenger and freight, indicates that, looking at the operations over a period of years, the "improvement" is productive, as truly as any other portion of the plant. Take the illustration of track elevation:

> "Years ago, when the railway was constructed, there were no buildings along its line, but in process of time a town has grown up, streets cross the track at frequent intervals, and the municipality requires that the tracks be raised, and this is done at a very considerable outlay. Now, the railroads urge that this improvement does not add to the earning capacity of the road. It may save a trifle in the way of gatemen at crossings, and may somewhat reduce the casualties for which the railroad is liable, but, on the whole, it is an expenditure which adds nothing to the net income of the railway." [1]

Considered solely as of a single year, or of a relatively short period of years, the conclusion of this paragraph may be accepted. But it overlooks the reasons which justify the expenditure. Traffic has become so dense, trains are so frequent, the town is so large, that conditions of public safety demand track elevation. And the same forces which make necessary the improvement normally bring larger gross earnings. The change in income is, however, one spread over time, and is less directly traceable, and less quickly seen, than where, for example, improvements to motive power at once bring lower operating cost.

In the case of "unproductive improvements," the underlying economic situation is not greatly different from that when a new railroad invades a territory as a competitor. Not the immediate but the ultimate prospect furnishes the inducement to invest. Indeed, if there was never expectation that the advantage secured would ultimately compen-

[1] 20 I.C.C. 243, 267. See also Brief of Messrs. Dunlap, Norton and Lathrop for the Santa Fé, Evidence, 1910 Advances, page 3567.

sate the Pennsylvania for the cost of the Pennsylvania Terminal in New York City (through being in position to compete with the New York Central on Manhattan Island), it is difficult to justify the project.[1] Even the "local pride" or the "æsthetic ambition" of New York does not warrant such economic waste as, in substance, it was testified the New York tunnels and station were believed to represent.[2]

Nor can the conclusion of the Railroad Securities Commission be accepted, that the carriers should be permitted to create "reserves" to provide "improvements which add nothing to the earning capacity of the property and ought not to be the basis of increased capital liability."[3] This argument overlooks the manner in which the return normally accrues on fixed investments. That conservative business policy may indicate the desirability of making such improvements without adding to fixed charges, is not *per se* ground for insisting that the public shall be asked to advance rates above a level compensatory for the old investment. The economic justification for such improvements is that the return from the business shall in the long run warrant the expenditure made.

And yet the mutual dependence of railroad and public interests is very real. So long as private enterprise is looked to for the development of transportation facilities, the railroads must be permitted to earn sufficient to make

[1] The "strategic" importance of adequate terminals was discussed in the Minnesota Rate Cases, testimony of Thomas Cooper, Record (N.P.), pages 134–36, 256–58. See also Manufacturers Ry. Co. *v.* St.L.I.M. & S. Ry. Co., 21 I.C.C. 304, 308; 32 I.C.C. 100, 108, 109; United States *v.* Terminal Association of St. Louis, 224 U.S. 383, covering the St. Louis Terminal situation.

[2] Testimony of President McCrea, Evidence, 1910 Advances, pages 2296–98. See testimony of President Ripley, of the Santa Fé, *ibid.*, pages 23–25. On the same point, see also the testimony of President Willard, of the Baltimore & Ohio, page 2359.

[3] *Report*, Railroad Securities Commission, page 30. The argument and conclusion suggest that the Commission is following Commissioner Prouty's opinion in the Eastern Advance Case of 1910, 20 I.C.C. 243, 267.

railroad investment attractive. It is this fact which would seem to invalidate any proposal that the rates be set at a level aiming to hew as close to the line of confiscation as would stand the test of court review. Though the return under a schedule of rates might not be "so unreasonably low" as to warrant putting them aside through process of injunction, the return might well fall short of being "reasonable."

The public is peculiarly interested in the future development of railroad facilities. Though the additions to the railroad net will probably not be as significant in the future as they have been, even in the more recent past, large expenditures must undoubtedly be made in the improvement of existing lines.

> "As our population grows denser, we shall need more and more to approximate European standards of construction by the increased amount of double track, the abolition of grade crossings, the development of station facilities both for passengers and for freight, and many other improvements scarcely less fundamental. While our railroads are perhaps even better equipped than those of Europe for the economical handling of large masses of long distance freight, they are far from being adequately provided with appliances to secure the convenience of the public or the safety of passengers and employees." [1]

The public body which regulates rates must therefore look to the adequacy of the railroad revenue, with an eye to making investment in railroad securities attractive to the investor in future years. An uncertain minimum level of charges is thus established.

But promise of a profit greater than that now needed in order to attract investment in a well-established railroad was originally necessary in order to attract investors of an earlier day who undertook pioneer risks. Once the enterprise has become profitable, and the risk in part eliminated

[1] *Report*, Railroad Securities Commission, page 35.

for future investors, shall it be conceived that a return sufficient to attract this future investment is reasonable, that anything more than this amount represents excessive profit? [1] Less than this would mean a check to railroad enterprise and to the further development of facilities. But can it be said that this minimum, so broadly stated, represents a *reasonable* return under the set of circumstances to be considered, that anything in excess represents extortion — "monopoly profit"? On the contrary, there are circumstances when a reasonable return is something more than "one which under honest accounting and responsible management will attract the amount of investors' money needed for the development of our railroad facilities." More than this is not always "an unnecessary public burden," even though it be granted, with the Securities Commission, that "less than this means a check to railroad construction." [2] And the conclusion follows because so considerable a portion of railroad investment represents pioneer risks.

The issue can be illustrated also by reference to that passage in Marshall's *Principles of Economics* where the "creation" of "economic rent" is discussed: "Sometimes the settlement of a whole town, or even district, is planned on business principles, and carried out as an investment at the expense and risk of a single person or company." Such a case was the founding of Pullman which he cites, or of Gary, Indiana, the great steel town. The business executives who planned these industrial centers "foresaw that the land, which they could purchase at its value for agricultural purposes," — the site of Gary was practically worthless sandy lake shore, — "would obtain the special

[1] This would seem to be the purport of Commissioner Prouty's discussion in the Eastern Advance Case of 1910, 20 I.C.C. 243, 263.

[2] *Report*, Railroad Securities Commission, page 36. See, however, testimony of President Willard of the Baltimore & Ohio, Evidence, 1910 Advances, pages 2398, 2399; illustrating that the railroads did not, as it would seem, make the most of the logic of their position.

situation value which town property derives from the immediate neighborhood of a dense population. . . . In all such cases, the yearly income derived from the land (or at all events that part of it which is in excess of the agricultural rent) is for many purposes to be regarded as profits rather than rent. . . . For in such cases great risks have to be run; and in all undertakings in which there are risks of great losses, there must also be hope of great gains." [1]

Apply this same general line of reasoning to the railroad. It owns a site, which its purchase withdrew from agricultural or other business use. A considerable "fixed investment" has been made once for all in grading a suitable roadbed. If the railroad fails to warrant construction — if abandonment follows (sometimes even this occurs) — the investment is lost for all time. Or, in the case of lesser ill-success, when it is found that operation nets something above operating expenses, though less than the anticipated return, the company must bear the burden of loss. The volume of traffic seeking transportation determines whether the railroad shall pay, or shall stand as a financial failure. But, at the beginning of the venture, the prospect of return must be sufficiently attractive to tempt the investor to assume the risk and responsibility of planning, constructing, operating. In the long run, and over the whole field of railroad enterprise, there must be successful ventures in order that a continuous flow of capital and business ability may be directed toward transportation.

> "The normal expenses of production of a commodity must include payment for the ventures required for producing it, sufficient to cause those who are on the margin of doubt whether to venture or not, to regard the probable net amount of their gains — net, that is, after deducting the probable amount of their losses — as compensating them for their trouble and their outlay." [2]

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[1] Alfred Marshall, *Principles of Economics*, pages 442–43; see F. W. Taussig, *Principles of Economics*, volume 2, page 89.

[2] Alfred Marshall, *Principles of Economics*, page 443. Failure to recog-

One further point: existing railroads do not represent the same exercise of judgment in original planning, the same efficiency in creating and maintaining an organization, in establishing relations with shippers and passengers, in solving operating problems. Clearly focused are seen the forces which make for the differential element in "business profits." The mode in which this differential accrues to the better located, better managed roads can be readily indicated.[1] Location is important from two points of view: from that of ability to secure large gross earnings, and from that of economical transportation of the traffic secured. The latter refers simply to the physical characteristics: to "strategic location" in a river gorge, to

nize the return to the investor as entering into the *long-run* cost of producing transportation service accounts for the frequent insistence that there is no relation between "valuation" and rates. The following is a typical utterance:

"It is perfectly obvious that the railroad rates of this country are not based on the value of railroad property. No railroad has ever undertaken to base rates on the value of its property, and no railroad man has ever attempted to make rates according to the value of the railroad." From the statement of R. S. Lovett, before the Railroad Securities Commission, 1910, in "Sayings and Writings about the Railroads," published by the *Railway Age Gazette*, page 109. See testimony of F. A. Delano, before the Senate Committee on Interstate Commerce, *Senate Report on Valuation*, page 45; and that of E. P. Ripley, Evidence, 1910 Advances, page 58.

[1] See discussion of "market value," above, page 150. The failure to see that the reasonable return could be a variable was undoubtedly at the basis of the "market value" test. Witness the following from Mr. Lawrence's Report to the National Association of Railway Commissioners, *Proceedings*, 22d Annual Meeting, page 144:

"The determination of market value as a basis for rate-making solves impossible problems. Take, for instance, two competing roads between the same terminals, one on a direct line and the other circuitous, the latter costing very much more to construct, or reproduce. It is apparent that competition will force an equality in rates. How, under the theory of actual cost or cost of reproduction, can the rates be fixed without allowing an excess on the one hand, or a deficiency on the other? Apply the theory of market value. The road with the direct line, lower cost of reproduction, and relatively lower operating expenses is of a higher market value under the circumstances."

Essentially the same argument is used by S. O. Dunn, *American Transportation Question*, page 93 and following.

the possession of a water-level route — which mean a lower ruling grade, less curvature, and therefore, other things being equal, a larger margin between operating expenses and revenue than would be possible were the road operated through the hills or mountains. It is the old question of the New York Central and the Pennsylvania, the one operating through river valleys and along the lake shore, going around the mountains, the other cutting through. An extra gain comparable to a site rent appears, as a reward for skill in original location, — perhaps even for the one company having first dared risk the cost of building.

Location has also an important bearing upon the quantity and classification of freight transported, and upon the density of the passenger traffic; and, consequently, upon the amount of the gross earnings. Much necessarily depends upon the natural resources of the tributary country, but not everything. In considerable degree the presence of industries is the result of active management which has secured the location of industries along the line of the road. Once an industrial community has been started, the gregariousness of industry has made itself felt by further grouping of similar plants in the same district. But efficient management in seeking out businesses for locations, and locations for businesses, and in establishing favorable rates has been a not inconsiderable factor in increasing the "traffic density" of the railroads. Similarly the policy of bringing settlers to a new country, inaugurated on a large scale by the Illinois Central, has been followed as other lines have been built into the newer West. Populations have been built up, in part the direct result of efforts by the railroad management, in part the result of "social" and economic forces.

The railroad in a country increasing in population and in "diversity" of the business afforded (and this is not necessarily a "new" country, though the phenomenon is there most strikingly seen) finds the swelling prosperity

of the tributary country reflected in the volume of its own gross earnings. Once the net earnings extend beyond the point which was necessary to induce the original investment, an element of "unearned increment" appears comparable to the "unearned increment" accruing on sites devoted to other than railroad purposes. From the nature of the case, it is difficult to say when the volume of net earnings exceeds the rate necessary to tempt investment. In those enterprises in which there are risks of great losses — surely railroad history would seem to bear out the inclusion of railroads in this category of ventures — there must be hope of great gain. Even though the source of the differential may be indicated as due to natural conditions (a "water grade," or the possession of a canyon pass, for example), to "social" causes (the increasing of population, the clustering together of allied branches of industry), or primarily as due to superior management, the actual income is a resultant of these forces. The "legitimate" differential return in profits, whether due to judgment in picking an original line which possesses superior operating conditions, or to subsequent active management in building up an efficient organization, or in establishing satisfactory relations with the shipping and traveling public, is intermingled with any return above the costs necessary to induce promotion and management of high grade. To bring American railroad service to its present preeminent place has required courage, imagination, skill of the highest order. The emphasis upon the important investments in railroad plant which are now being made — track elevation, passenger terminals — as "unproductive" indicates the presence still of a considerable risk element. In the light of the composite nature of the railroad return, it would, therefore, appear well-nigh impossible to isolate an element of "unearned increment." [1]

Entirely aside from the issue of the practicability of

[1] See F. W. Taussig, *Principles of Economics*, volume 2, page 98.

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On the Federal Valuation, the various briefs filed with the Commission should be consulted, especially that filed on behalf of the railroad companies represented by the Presidents' Conference Committee, here cited as the Valuation Brief of 1915. The publications of the Division of Valuation are also important, and those of the General Secretary of the Presidents' Conference Committee, especially the *Proceedings* of the various valuation conferences between representatives of the carriers, the State commissions, and the Interstate Commerce Commission.

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